SOUTHERN POWER AND INDUSTRY

JULY, 1955

HELPING THE

Southern and Southwestern plant engineers and maintenance men report on plant-tested ideas, methods and gadgets.—See page 62.



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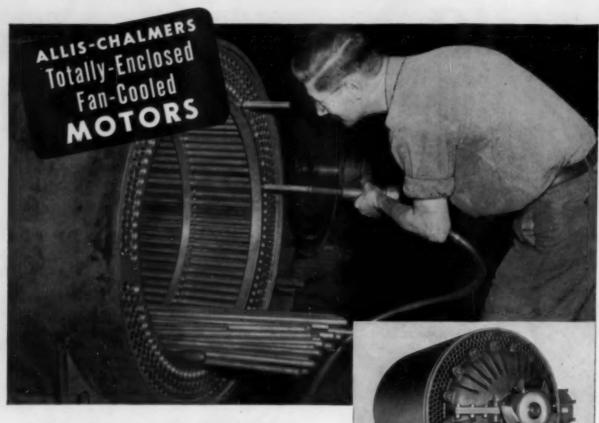
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These heat exchanger tubes

Protect this motor from 3600-rpm expression

osion

3600-rpm explosion-proof motor with fan housing

Cooling AIR is carried through the heat exchanger tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length — cooling all parts of the motor evenly.

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You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult

applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Get Complete Information

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

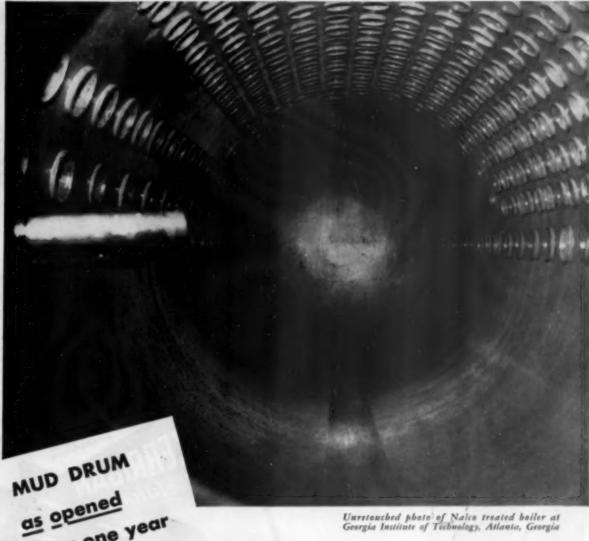
ALLIS-CHALMERS

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Volume 73

Number 7



Unretouched photo of Nalco treated boiler at Georgia Institute of Technology, Atlanta, Georgia

after one year on line with

• Calling this a mud drum serves only to identify its location . . . it is perfectly clean after a full year on line. The unretouched photo was taken immediately after the drum was opened. No wash-out was necessary. Not only is the drum free of scale and corrosion . . . Nalco sludge conditioning operated so effectively that even under the static, off-line draining condition, no sludge deposited in tubes or drums.

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No. 7

JULY 1955





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J. A. Moody, Production Manager

Business Representatives

- E. L. Rogers, 299 Madison Ave., New York 17, N. Y .- Phone Murray Hill 2-4959.
- George Isherwood, 596 Rutherford Dr., Springfield (Del. Co.), Pa.—Phone KI 8-0766.
- J D. Parsons, 38 Atlantic Ave., Cohasset. Mass.—Phone 4-9712.
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- A. C. Peterson, 333 North Michigan Ave., Chicago 1, Ill.—Phone Central 6-6964.
- L. B. Chappell, 810 So. Robertson Bivd., Los Angeles 35, Calif.—Phone Crestview 4-5151.
- Karl H. Mayers (for N. J. north of Trenton), 11 Ale Wives Road, R.P.D. 2, Norwalk, Conn.—Phone Temple 8-2187.
- W. Cliff Rutland, P. O. Box 162, Gastenia, N. C.—Phone 7998.

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Editorial and Esecutive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA S. GEORGIA

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

July, 1955

POWER FOR A GIANT LUMBER MILL--The completely electrified Kirby Lumber Corporation mill at Silsbee, Texas, designed to produce 75 million board feet per year of Southern yellow pine products, is one of the largest and perhaps the most modern pine lumber mill in the country.

Facilities include ponds for underwater storage of barked logs, hydraulic barkers, a sawmill with four double cutting bandmills, log carriages with electric motor drives, chippers, mechanical edge sorters, stackers, dry kilns for the entire production, unstackers, surfacers, high bay crane type storage shed and shipping buildings.

High efficiency power plant (six hundred pound pressure) burns mill residue consisting of hogged wood waste, bark, trimmings and shavings and sawdust. Good efficiency of the power plant permits the sale of chips to pulp mills without having to supplement the fuel supply to the power plant with outside fuel. Thus the sale of chips does not have fuel charges against it, and yet the mill provides all of its own fuel for normal operation. Technical details are reported in this issue by Richard B. Robertson of H. E. Bovay, Jr., Consulting Engineers, of Houston, Texas, who designed the ultra modern mill.

PRODUCTION FLEXIBILITY—Big design feature of General Electric's multimillion dollar electric controls plant in Waynesboro, Virginia, is FLEXIBILITY. Complete plant can be reorganized with new production lines and a new layout made within two weeks. All machinery is free standing, including presses, brakes, lathes, and mills—with no in-floor bolting. Connections for water, air, and power are made to overhead supplies with flexible couplings.

The Waynesboro, Virginia, plant will be the first new industrial facility of its size ever built for the specific purpose of producing electronic controls for use on mechanized production lines. The 190,000 sq ft plant will eventually employ 500-600 with an annual payroll of approximately 2½ million. One out of three of these employees will be in the engineering function of production.

WHAT'S AHEAD?--In view of the rapid expansion of industry in the South in recent years, Dr. Frank Soday, vice president of The Chemstrand Corporation, recently predicted that the South will have 30% OF THE COUNTRY'S MANUFACTURING FACILITIES by 1965. In order to do so, it will be necessary to build approximately three plants per day during this period, or a total of 10,000 PLANTS IN 10 YEARS. Each state, on the average, will add 700 plants to its industrial potential by 1965.

To many Southerners the pot of gold at the end of the rainbow looks remarkably like a test tube. Dr. Soday emphasized that the South is betting on chemicals in a big way. The SOUTH HAS ONE-THIRD of the NATION'S CHEMICAL INDUSTRY, and it is expected that this will increase to ONE-HALF within the next 10 years. The majority of the chemical industry will undoubtedly be located in the South by 1975.

Petrochemicals are the backbone of the Southern chemical industry, and over 80% of all of the petrochemical plants in the country are located in the South. Petrochemicals account for over 25% of all of the chemicals produced in the country today, and it is expected that this will increase to 50% within the next decade.

(Continued on page 6)

Originators not Imitators

"Every kind of imitation speaks the person that imitates as inferior to him whom he imitates, as the copy is to the original."

LORD SOUTH



ing and every other in-dustry, you will always find those whose only claim to fame for their product is that it is "just as good."

In every age, in weld-

More than 50 years ago, J. P. H. Wasserman, a Swiss metallurgist, pioneered a new welding process. He blazed a trail that others have tried to follow. Relentless research following his discovery has perfected Eutectic's "Low Heat Input" metal joining process which provides the high strengths of fusion welding using the lower heats associated with brazing.

Eutectic's research has never been equalled. Very simply, that is why no welding material imitating Eutectic "Low Temperature Welding Alloys" Can be "just as good" or produce equal results and

Year after year, "Eutectic" has originated new and ever better welding alloys to make the weldor's job easier and more profitable. The rapidly increasing preference for Eutectic "Low Temperature Welding Alloys" in over 87,000 American industries is proof of Eutectic's leadership. It is testimony that the American weldor is too smart to be fooled by imitations. The American weldor realizes the importance of getting all the advantages of Eutectic's "Low Heat Input" metal joining processthe elimination or minimization of overheating, warping, distortion, embrittlement and other dangers to base metals.

To the weldor, Eutectic's process means "Better, Faster, Cheaper" welding. To industry everywhere, "Eutectic" has made welding more profitable, with an everwidening field of application for production, maintenance, and salvage of metals and metal products.

A FEW "EUTECTIC" FIRSTS

- U.S. Patent #2,583,163. Surface alloying process for bonding metals.
 U.S. Patent #2,288,869. First Yorch Alloy
- for joining cast iron with color match, without fusion.

 8. S. Patents =2,359,613, =2,410,650, =2,544,000. First metallic film
- coating to enhance Surface
- U.S. Patents =2,279,282, =2,279,283, =2,279,284. First nickel bearing copper allay for high ten-
- u.s. Patent #2,481,053. First torch alloy and flux for joining high alumi-num content metals. U.S. Patent #2,471,803. First "Low Amp"
- coating for metal arc welding of cast iron.
- U.S. Patent #2,632,000. First lew-melting electrode for high tensile strength joining of aluminum. U.S. Patent #2,632,635. First "Lew Amp"
- electrode coating for high alloy steels. U.S. Potent #2,626,339. First electrode
- for high tensile strength join-ing of copper,

RESEARCH—BACKBONE OF PROGRESS

During the past 50 years Eutectic Welding Alloys Corporation has learned much. It is possible for imitators to analyze our welding rods, electrodes and fluxes. But originating and producing them is an achievement only "Eutectic" can claim. Only the long, hard road of doing it can provide the answers.

The time spent in imitation is lost, for long before a "copy" can be made, Eutectic's research has perfected other new and improved materials.

Today, in Eutectic's own research centers throughout the world, teams of metal experts create and test newer and better products for metal joining. And, in its products for metal joining. And, in its own up-to-the-minute plants, meeting rigid standards of quality, "Eutectic" turns these research products into "Low Temp" EutecRods and "Low Amp" EutecTrodes that bring the benefits of "Low Heat Input" metal joining into shops everywhere.

ORIGINATORS NOT IMITATORS

The research behind this phrase is your assurance of the most modern welding materials known. It is your assurance that you are applying advanced "Low Heat Input" metal joining techniques to your critical work and that you have the most modern developments at your fingertips.

Don't be fooled by those who tell you that any ordinary rod or electrods is "just that any o

that any ordinary rod or electrode is "just as good." Nothing can match Eutectic "Low Temperature Welding Alloys"

performance.

Remember, it is the quality of the finished job and the ease and speed with which you do it that determines real economy, and not a few pennies difference in original cost. Because of its research facili-ties, only Eutectic Welding Alloys Corpo-ration gives you true "Low Heat Input" metal joining and helps you eliminate the risks of dangerous overheat overheating and the subsequent distortion and damage to base metals. And that, after all, is what you are always after.

READY TO PROVE WHAT WE SAY

To bring you all the benefits of Eutectic's research, our District Engineers are ready to go right into your shop to show you how Eutectic "Low Temperature Welding Alloys" will solve your welding problems. Your Eutectic District Engineer will show you how the same electrode will show you now the same electrode holder or torch you use with conventional materials gives you "Better, Faster, Cheaper" welds with "Low Temp" EutecRods and "Low Amp" EutecTrodes . . . with substantial savings in work, time, gas and welding materials.



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To help you select from among the more than 160 EuterMods and EuterTrodes those that will give you largest savings per job, will give you free copy of our new 32-page DirectoRod luide. Whatever your wedding problem—production, naintenance or salvage, there's a EuterRed or tuterTrode to do the job faster, better, and cheaper. Ise the convenient coupon below.

SYMBOLS OF DEDICATION

These seals denote our proud contribution to American industry: 15 Years of "Golden" Savings, 50 Years of Research. These years have

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seen many great achievements. And, for the future, we look forward to ceaseless weldgineering and the continued application of Eutectic's research to your service.

anasseruly dent, Founder, Director of Research

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Facts and trends (continued from page 4)

THE SOUTHWESTERN STATION--Public Service Company of Oklahoma's first experience with totally outdoor station design--will be highlighted in SP&I for August, 1955. Station consists of two 80,000 kw units. Designed for an ultimate capability of 500,000 kw, this station is now the largest on the system, which consists of seven major plants with a capability of 416,500 kw.

This station challenged the ingenuity of both designers and the operating personnel to adequately protect the instruments, piping and equipment, which are out of doors. Results have been quite gratifying. There have been no outages due to the outdoor installation, nor has there been any loss of instrumentation or piping due to freeze-ups.

R. O. Newman, formerly Chief Engineer of the Southwestern Station and now Assistant to the Superintendent of Operation and Construction, will report on the design and operating features in next month's issue.

► WATER CONSERVATION CASE STUDY -- At the Pegasus Plant of Magnolia Petroleum Company, Midland County, West Texas, the use of Solo-Aire and Combin-Aire cooling units (Hudson Engineering Corporation, Houston, Texas) has proved advantageous. Installation has resulted in savings in first cost, in operating costs for horsepower, water treating, and maintenance. It also eliminated the necessity for drilling several water wells.

> Air is used directly for cooling in the Hudson Solo-Aires where low temperatures are not required. The Combin-Aire uses a small quantity of water to precool the air so that entering hot fluids may be cooled to effluent temperatures lower than those obtainable by direct use of air.

> If the heat load in this plant had been dissipated through a conventional cooling tower, 158 million gallons of water per year would have been required for makeup. The actual annual water makeup for the plant is only 17 million gallons per year.

TESTING LABORATORIES--The American Society for Testing Materials and the National Bureau of Standards have agreed that ASTM will undertake the responsibility for compilation and publication of the DIRECTORY OF COMMERCIAL AND COLLEGE TESTING LABORATORIES, formerly issued by NBS.

The directory gives information regarding location of testing laboratories together with the types of commodities and nature of investigations they are prepared to undertake. Copies of the recently issued directory can be obtained from the ASTM, 1916 Race St., Philadelphia 3, Penna., at \$1 per copy.

was IT EVER DONE? Have all the things you have asked others to do actually been done? Can you prove it? E. L. McDonald, Results Engineer of the Kansas City Power & Light Company, emphasizes that if you have no system, you would be surprised at the number of requests for information that just die a natural death.

We might surmise that if these requests were important they would not die. However, Mr. McDonald reminds us that "Your job (or mine) is not made up entirely of highly important things, but includes a lot of lesser important items, that if neglected, can add up to a lot of loss."

In a large organization, undesirable conditions can remain hidden and exist for years, costing thousands of dollars--all because some well meaning individual forgets. Frequently, problems difficult to solve are put off until tomorrow. Of course "tomorrow" never comes, unless you have a follow-up system. In this issue Mr. McDonald cites case studies to prove the value of a follow-up (see Contents, page 3) and suggests an economical fool-proof system.



CLEAVER-BROOKS SELF-CONTAINED BOILERS HAVE THE FEATURES EVERYONE WANTS!

... which feature would be most important to you?



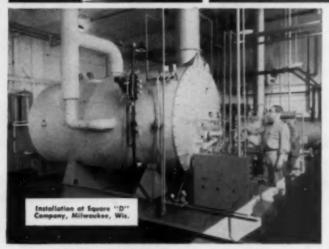
ARCHITECT 'Soff-contained design certainly simplifies baller room planning gives awners maximum use from each square foot of space. Gives me flexibility to make best use of low hood room conditions."











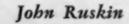
THESE are just a few of the many outstanding features that have made more than 15,000 individual Cleaver-Brooks self-contained boilers first choice for commercial, institutional and industrial applications. Get in touch with your nearest Cleaver-Brooks representative for complete facts, or write for catalog AD-100. Cleaver-Brooks Co., Dept. H, 305 E. Keefe Ave., Milwaukee 12, Wis., U.S.A. — Cable address: CLEBRO — Milwaukee — all codes.



"It's NEW — get the facts on the CB boiler — write today!"

BOILERS - STEAM OR HOT WATER - FOR HEATING OR PROCESSING IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI.

"There is hardly anything in the world that someone cannot make a little worse and sell a little cheaper—and the people who consider price alone are this man's lawful prey."



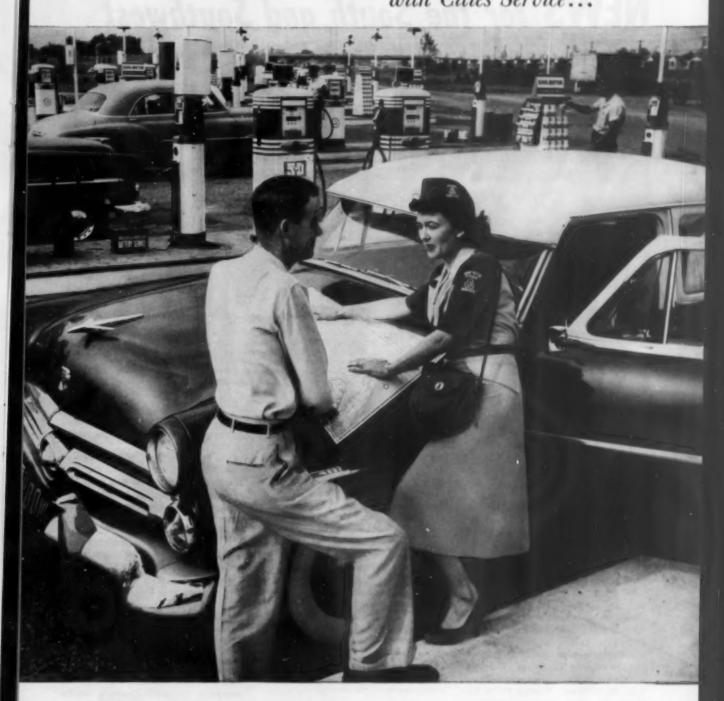


* We make our products better but never cheaper
... striving for quality and performance, rather
than the lowest price.

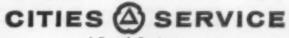
Crosby Steam Gage and Valve Company, 43 Kendrick Street, Wrentham, Mass. . . . manufacturers of Safety Valves, Relief Valves, and Pressure Gages.



GOING PLACES is always easier with Cities Service...



Helpful directions to travelers on major turnpikes is just one small reason why the green-and-white emblem renews its welcome daily.



A Growth Company

NEWS for the South and Southwest



CONFERENCE PLANNERS AT WORK.—J. C. Gardner, Houston, Texas: W. T. Robin, Houston, Texas: W. H. Dickinson, Chairman, Refining Subcommittee, Linden, N. J.; J. R. Ashley, Chairman, Production Subcommittee, Dallas, Texas: R. S. Gardner, Asst. Secretary, Technical Activities, A.I.E.E. Headquarters, New York City: H. M. Stewart, Conference Arianta, Baytown, Texas: J. Z. Linsenmeyer, Chairman, Petroleum Industry Committee, Pittsburgh, Pa.; W. E. Silvus, Houston, Texas: E. A. Clarke, Baytown, Texas: O. A. Beyer, Carpus Christi, Texas: and H. J. Kengabel, Conference Vice Chairman, Houston, Texas.

Second Electrical Conference for the Petroleum Industry Scheduled for Houston—Sept. 12-14th

The second ELECTRICAL CONFERENCE OF THE PETROLEUM INDUSTRY will be held at the Shamrock Hotel, Houston, Texas, September 12, 13, 14, 1955. It is sponsored by the Petroleum Industry Committee and the Houston Section of the American Institute of Electrical Engineers.

Technical papers and discussions will be presented which deal with electrical subjects in the Refining, Production and Pipe Line fields of the petroleum industry. Field trips to nearby installations will be offered and the sessions will be open to all interested persons.

H. M. STEWART, Humble Oil & Refining Company, Baytown Refinery, Baytown, Texas, has been named Conference Chairman. The Conference Vice Chairman is H. J. KONGABEL, Westinghouse Electric Corp., Houston, Texas.

J. Z. LINSENMEYER, Westinghouse Electric Corp., Pittaburgh, Pa., is chairman of the Petroleum Industry Committee. Subcommittee Chairmen are: Production—J. R. Ashley, Magnolia Pipe Line Company, Dallas, Texas; Refining—W. H. Dickinson, Standard Oil Development Company, Linden, New Jersey; Transportation—R. S. Cannon, Plantation Pipe Line Company, Atlanta, Georgia.

Advanced registration forms and programs may be obtained from J. C. GARDNER, Westinghouse Electric Corp., 507 Dallas Avenue, Houston 2, Texas.

Last year's Conference, held in Tulsa, Oklahoma, was attended by 389 engineers from twenty-two states and Canada.

A-C Expansion-Ala.

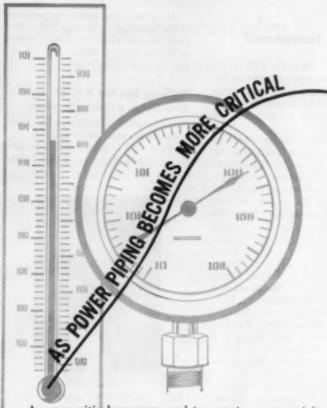
ALLIS-CHALMERS MANUFACTURING COMPANY recently announced plans for a multi-million dollar transformer and circuit breaker manufacturing expansion program at its GADSDEN, ALABAMA, and Terre Haute, Ind.,

The manufacture of distribution transformers is scheduled to begin at the Gadsden plant late this year, according to J. W. McMULLEN, vice president, transformer and switchgear equipment. He explained that utilization of the Gadsden plant would give Allis-Chalmers an electrical manufacturing facility in the South, where great electrical expansion is taking place.

New Location for Charlotte Office of J. J. Finnigan Co.

The CHARLOTTE office of J. J. FIN-NIGAN CO., INC., of ATLANTA, GA., has been moved from 1425 Elizabeth Avenue to 401-402 Builders Building. The company fabricates boilers, smokestacks, storage tanks and similar industrial items of steel and alloys.

With headquarters at 722 Marietta St., N.W., ATLANTA, GA., the J. J. FINNIGAN Co. also maintains sales offices in Little Rock, New York City, Houston, Dallas, Jacksonville and Washington.



M. W. KELLOGG
WELDING
TECHNIQUES
KEEP PACE

As supercritical pressures and temperatures are put to work more and more in improving the economics of steam-electric plants, supercritical engineering and workmanship are demanded of the welding techniques for main and reheat steam piping.

At M. W. Kellogg, one of the many ways by which the company's power piping fabrication keeps pace with steam boiler and turbine designs is K-Weld*... a unique inert gas shielded arc welding technique that assures complete penetration and a highly uniform internal contour without the use of backing rings.

No welding problem in the shop or field is too tough for K-Weld. Developed through M. W. Kellogg's initial work on thin-walled stainless steel rockets, K-Weld safeguards the vital link between boilers and turbines in steam-electric central stations throughout the U.S. and Canada. Write for particulars. K-Weld's indicated uses in nuclear plant applications also warrant your investigation.

FABRICATED PRODUCTS DIVISION

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The Canadian Kellogg Company, Ltd., Toronto Kellogg International Corporation, London
SUBBIDIARIES OF FULLMAN INCORPORATED

*Trademark of The M. W. Kellagg Company



This 12-page booklet describes K-Weld in detail as well as M. W. Kellogg's other facilities for serving the power piping needs of modern central stations.



News for the South and Southwest (continued)

Eutectic Welding Expands Southern Distrib. & Service

EUTECTIC WELDING ALLOYS CORPORATION, Flushing, N. Y., pioneer of "Low Heat Input" metal joining, is matching the South's tremendous industrial growth with top-level manpower heading new teams of District Engineers able to serve industry with information on advanced metal-joining techniques.



JAMES P. COUGHLIN, Assistant to the President, heads the top-level team Eutectic now has in the South to help its distributors set up and strengthen special welding departments.

Eutectic has assigned its Assistant to the President, James B. Coughlin, and a veteran Divisional Manager, Robert H. Welch, to the job of helping Southern Distributors of Eutectic "Low Temperature Welding Alloys" set up welding departments and field service organizations.



ROBERT B. WELCH is the newly appointed Southern Divisional Manager for Eutectic Welding Alloys Corporation.

Mr. Coughlin brings a wide experience to the South, having served for 15 years as Manager of the Arc Welding Division of Westinghouse Electric

Company before joining Eutectic. Mr. Weich has many years of experience with Eutectic's metal joining process and recently moved to the South from the West Coast.

Special Eutectic welding service departments are maintained by the following leading Southern distributors: Dixie Supply Company, Anderson, S. C.: Louisiana Welding Supply Co., BATON ROUGE, LA.; Post Welding Supply Co., BIRMINGHAM, ALA.; The Cameron & Barkley Co., CHARLESTON, S. C.; Southern Auto Supply Co., Inc., CHATTANOOGA, TENN.; Dixie Hardware & Mill Supplies, Inc., GREENwood, S. C.; Capitol Welding Supply Co., JACKSON, MISS.; The Cameron & Barkley Co., JACKSONVILLE, FLA.; Southern Auto Supply Co., Johnson CITY, TENN.; Delta Oxygen Co., Inc., MEMPHIS, TENN.; The Cameron & Barkley Co., MIAMI, FLA.; Nunn's Battery & Electric Co., Inc., MONT-GOMERY, ALA.: R. H. Chilton Co., Inc., NASHVILLE, TENN.; C. T. Patterson Co., Inc., NEW ORLEANS, LA.; Opelika Equipment Co., Inc., OPELIKA, ALA.; Southern Auto Supply Co., ROME, GA.; The Motor Supply Co., Inc., SAVANNAH, GA.; Allied Welding Co., SHREVEPORT, LA.; The Parts Company, COLUMBIA, S. C.; Brant Supply Co., Inc., GASTONIA, N. C.; and Mill & Mine Supply Co., KNOXVILLE, TENN.

The special welding departments of these and other distributors provide a shop-to-shop welding advisory service. Newest techniques of saving on maintenance welding are shown to foremen and welders.

Cooper-Bessemer-Tulsa

THE COOPER-BESSEMER CORPORA-TION, Mount Vernon, Ohio, announces the appointment of DONALD E. DIXON as field engineer of the TULSA, OKLA-HOMA, office.

Mr. Dixon will devote his activities to both application and sale of engines and compressors for service on pipe line transmission for petroleum and chemical processing in the Oklahoma area. He will work under the direction of Byron L. Potter, Cooper-Bessemer Vice President and Branch Manager of the Tulsa field office.

More News-Page 77

Mr. Dixon was formerly manager of the Compressor Section, Sales Department, at Cooper-Bessemer's plant in Mount Vernon, Ohio.

Guillory Elected V.P. of New Orieans Public Service

The Board of Directors of New Obleans Public Service, Inc., recently elected J. Mason Guillory, Director of Advertising, as a Vice President of the Company.



J. Mason Guillery

Mr. Guillory, who has been with Public Service since 1931, was educated in the public schools of New Orleans, and at Tulane University where he received a degree in mechanical and electrical engineering in 1928.

Prior to his coming to Public Service, he served as power engineer in oil refineries. His work with New Orleans Public Service, Inc., included assignments in all phases of its commercial and industrial sales operations. He was manager of the Industrial and Commercial Sales Division from 1942 until 1952, when he became Director of Advertising.

Mr. Guillory has actively participated in the work of engineering and utility industry organizations. He has been chairman of committees of the Edison Electric Institute, Southeastern Electric Exchange, and Southern Gas Association.

He is a past president of the New Orleans Section of the Illuminating Engineering Society and was general convention committee chairman at the meeting of the National Society which was held in New Orleans.

In 1952 he headed the Sales Executives Council of the Chamber of Commerce of the New Orleans Area, working to further the Council's objective of advancement of the sales profession.

The USS Forrestal-

another example of how Walworth helps protect a 200 million dollar investment

Walworth products installed aboard the USS Forrestal include gate, globe, and lubricated plug valves and pipe fittings. They are used on high pressure air lines, fire mains, and most of the other piping systems throughout the ship.

Thousands of Walseal® Bronze Valves, Fittings, Flanges, and Unions comprise the major portion of the Walworth installations.

Walseal is a registered trade mark which identifies valves and fittings manufactured by the Walworth Company. Walseal products have factory-inserted rings of silver brazing alloy in threadless ports. Walseal joints can be made only with Walseal valves and fittings.

WALWORTH

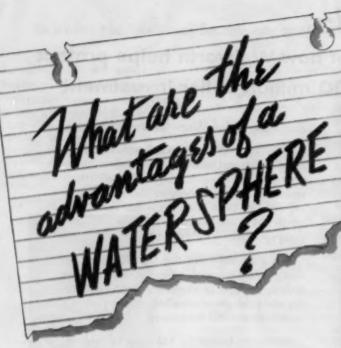
valves...pipe fittings...pipe wrenches 60 East 42nd Street, New York 17, N. Y. Walworth Company of Canada, Ltd., Toronto Keel laying to launching-Walworth was there.

Walworth engineers worked with designers, metallurgists and builders of the mighty flat-top right from the blueprint stage. Their efforts assured the builder – Newport News Shipbuilding and Dry Dock Company – that every Walworth Valve and Fitting installed would meet every specification right down to the finest detail.

The Forrestal—like the USS Nautilus, the first nuclear-powered submarine—is another striking example of where Walworth engineering and products were called upon to protect a multimillion dollar investment.

Walworth, backed by 113 years of practical valve experience, is skilled in every type of installation. Whatever the industry, if your problem concerns valves or fittings, it will pay you to call on Walworth! Distributors in principal cities throughout the world.





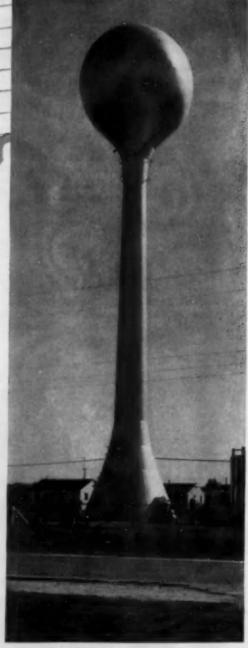
The main advantages of a Horton Watersphere® are:

- They take up less ground space than conventional elevated tanks.
- There is less surface area to paint and maintain.
- The base may be used as a pump house or for other storage purposes.
- The modern, streamlined Watersphere lends an up-to-date look to the community or plant where it is installed.

A typical case history shows why Waterspheres are increasing in municipal as well as private water systems. A 100,000-gallon Watersphere installed in the municipal water system at South Houston, Texas, helped reduce pressure variations and increased minimum distribution pressures 15 lbs. per sq. in. throughout the entire system. There is now more water on hand at all times for fire protection and other emergencies.

Write our nearest office for further information on Horton Waterspheres.

Right: 100,000-gallon Horton Watersphere installed for municipal water service at South Houston, Tex.

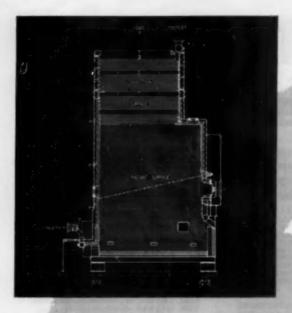




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For those applications where high-temperature water has advantages over steam — and there are many — this boiler has many special features such as:

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- 5. Other features such as: steel enclosed setting few headers, all accessible any fuel, oil, gas or coal.

Sizes from 15 to 150-million BTU per hour, or more - pressures to 300 psi - temperatures to about 425 F.

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Of course, if larger capacities are needed the Combustion line includes boilers of any capacity – for any pressure – for any fuel or method of firing.

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B-820A

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The VU-10 is available in nine sizes from 10,000 to 60,000 pounds of steam per hour ... for design pressures up to 475 psi ... up to 200 degrees of superheat available in 20,000-60,000 lb range ... for solid, liquid, or gaseous fuels. A completely standardized design adeptable to many conditions and particularly well suited to plants having small operating and maintenance forces. It performs efficiently over a wide range of output, and is easy to operate and to maintain.



This shop-assembled boiler is available in fourteen sizes from 4,000 to 42,000 pounds of steam per hour . . . for design pressures up to 500 psi . . . up to 200 degrees of superheet available in sizes above 21,000 pounds capacity . . for pressure firing of liquid or gaseous fuels. The VP Boiler has more water-cooled area per cubic foot of furnace volume than any other boiler of its type. The VP is enclosed in a reinforced, gastight, welded steel casing, and shipped completely assembled with firing equipment, fittings and forced draft fen. For foundation, it needs only a simple concrete slab.

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Please be sure to fill in your Firm's Name and your position on the Coupon. This service cannot be extended to you unless this information is furnished.

Please send me without obligation, free booklets described in the July, 1955, issue of SOUTHERN POWER AND INDUSTRY as circled below. 51 56 71 76 88 93 121 124 128 132 158 176 190 197 200 202 227 264 267 271 277 280 306 312 336 337 340 360 410 416 421 432 449 456 475 503 511 518 519 524 548 565 572 576 594 636 643 702 718 726 732 768 776 803 830 846 851 858 620 627 631 612 901 914 921 935 979 S-1 S-2 S-3 S-4 S-5 S-6 S-7 S-8 S-9 S-10 S-11 S-12 S-13 S-14 S-16 S-16 S-17 S-18 S-19 S-20 S-21 S-22 S-23 S-24 S-25 Also send further information on following New Equipment (page 68) G-1 G-2 G-3 G-4 G-5 G-6 G-7 G-8 G-9 G-10 G-11 G-12 Name Position Company Name Street City Zone..... State





BUSINESS REPLY CARD FIRST CLASS PERMIT NO. 582, SEC. 34.9, P. L. & R., ATLANTA, GA.

Equipment and Review Editor SOUTHERN POWER AND INDUSTRY 806 Peachtree St., N. E. Atlanta 5, Ga.





THERE IS A LOW COST WAY

WITH THE A-S-H LOW PRESSURE SYSTEM

Most pollution control systems—high pressure systems—are expensive—expensive to install, costly to maintain, costly to operate.

The most efficient and economical answer to pollution control problems—where ash or dust is the contaminant—is the A-S-H Low Pressure Hydraulic Recirculating System. You will save money four ways:

- On Installation. A-S-H designed systems are simpler, require less expensive components and are more easily installed.
- 2. On Operation. Power consumption is low. One A-S-H Hydroseal Ash Pump is sufficient for most systems.
- On Water. Where water is scarce, the system can be completely closed, eliminating any outflow of polluted water and requiring only a minimum of water for make-up.
- On Maintenance. No periodic cleaning is required. Wearing parts last longer on A-S-H Hydroseal Ash Pumps, which means lower replacement costs.

If you have a problem involving ash or dust disposal, do not overlook the advantages of A-S-H Low Pressure Systems. An A-S-H Materials Handling Engineer will be glad to discuss your problem with you—without obligation, of course. Or, if you prefer, write Dept. A2, requesting Data Sheet Pa which describes the A-S-H Hydroseal Ash Pump, the heart of the A-S-H Low Pressure System.

The Allen-Sherman-Hoff Company

259 E. Lancaster Ave., Wynnewood, Pa. Offices and Representatives in Principal Cities



MATERIALS HANDLING SYSTEMS hydrojet hydraulic / hydrovac pneumatic



Old hands at solving new insulation problems

Your J-M Insulation Contractor knows the answers that give you a better, more economical job

To be sure of getting the most efficient insulation for your plant or equipment, see the man with the world's most complete engineering and application service. He's your J-M Insulation Contractor who brings to every job the accumulation of Johns-Manville's 95 years' experience in the thermal insulation field.

J-M Insulation Engineers work hand in hand with J-M Insulation Contractors. Together they have achieved outstanding results with some of the most intricate insulation problems . . . of every type and size—in every industry.

J-M Insulation Contractors provide a complete selection of Johns-Manville quality materials. They will choose from their own stocks the best insulation for your conditions within the broad temperature range extending from minus 400F to plus 3000F.

Skilled application is a major contribution your J-M Insulation Contractor brings to every insulation job. His skilled mechanics have mastered the latest application techniques that assure you topquality installation . . . give maximum operating economy and lower maintenance costs.

For undivided responsibility on all your insulation requirements, call your J-M Insulation Contractor. Write for the name of the one nearest you. Address Johns-Manville, Box 60, New York 16, New York. In Canada, Port Credit, Ontario.



Johns-Manville firstin INSULATION

Here's 57AN5 Quality Control at work...for you!

These dials, gages and recorded graphs are the story behind SPANG quality control. Located beside the heating furnace, they automatically control the furnace heat zones at pre-determined temperatures as top-quality skelp is heated prior to the forming and welding of SPANG CW Steel Pipe.

It's the right combination of controlled gas and pre-heated air entering the various sections of the furnace that produces top-quality SPANG Pipe with strong, clean, uniform welds.





Add to this the fact that each length of SPANG CW Steel Pipe is descaled inside and out to give it a smooth, clean finish . . . is sized and straightened to give it uniform diameter . . . is tested and inspected completely to assure a top-quality product . . . and you have the complete SPANG quality control story.

These quality features save you time ... save you money on installations.

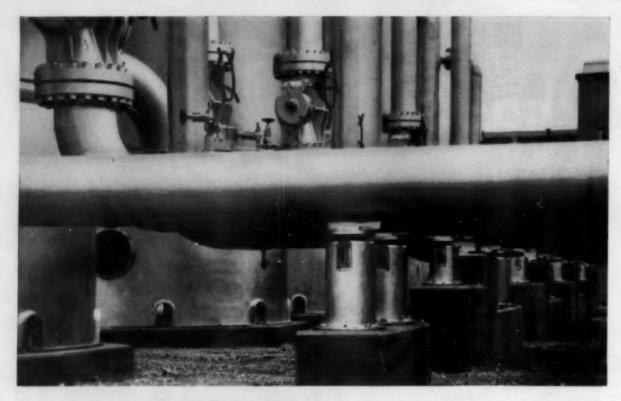
All this means is that SPANG CW Steel Pipe is tops for plumbing, heating, air conditioning, radiant heating and snow-melting installations. Your nearby SPANG Distributor carries a complete stock of SPANG Pipe. Let him serve you!

SPANG-CHALFANT

DIVISION OF THE NATIONAL SUPPLY COMPANY

General Soles Office: Two Goteway Center, Pittsburgh, Pa, District Soles Offices: Atlanta, Bestan, Detroit, Houston, Los Angeles, New York, Philodelphia, Pittsburgh, St. Lovis

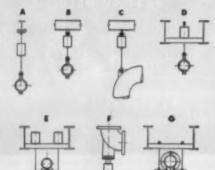




For flexible support of piping

Grinnell Pre-Engineered Spring Hangers

AVAILABLE IN 7 TYPES FOR THESE TYPICAL APPLICATIONS



(Type A) Rod threaded to top cap (Type B) Furnished with single lay (Type C) Twe lay style (Type D) Top adjusting (Type B) Adjustable top and bottom (Type F) for base support (Type G) Trapeze assembly.

The Grinnell Pre-Engineered Spring Hanger was developed after years of experience in analyzing the problems of flexible pipe suspension systems. It is pre-engineered to minimize changes in supporting force over total range of movement. Consider these outstanding features:

- Maximum variation in supporting force per ½" of deflection is 10½% of rated capacity in all sizes.
- Precompression* assures operation of spring within its proper working range, as well as saving valuable eraction time. Reduced over-all height soves space.
- Solid steel cosing protects spring from damage and weather. Guides assure continuous alignment and concentric loading of spring.
- 18 sizes available from stock for load ranges from 53 lbs. to 12,000 lbs.
- Available in 3 spring lengths for travel ranges of 1¼, 2½, and 5 inches.
- Installation is simplified by integral load scale and travel indicators.
 *Precompression is a patented feature.

CDIMMEI

AMERICA'S #1 SUPPLIER OF



Grinnell Company, Inc., Providence, Rhade Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings * welding fittings * engineered pipe hangers and supports * Thermolier unit heaters * valves

Grinnell-Saunders diaphragm valves * pipe * prefabricated piping * plumbing and heating specialties * water works supplies

industrial supplies * Grinnell automatic sprinkler fire protection systems * Amco air conditioning systems



What are the men doing?

They are retubing the fuel economizer.

What happened to the old tubes?

Sulphuric acid ate holes in them.

Who put sulphuric acid in the fuel economizer?

Well, nobody meant to. But there was too much sulphur in the coal and when the coal burned some of the sulphur was turned to sulphuric acid.

Why did they purchase the high sulphur coal?

It figured out cheaper on the cents-permillion-BTU basis.

But was it really cheaper by the time they put the new tubes in?

No, it wasn't! And this instance shows that BTU cost is not the only factor to be considered in buying fuel. It's a matter of matching fuel to use and to equipment, and that requires close cooperation between the plant engineer and the purchasing agent.



There's a lot more to buying coal than the cost per ton. For facts and figures to solve your particular fuel requirements, write to: R. C. Riedinger, General Coal Traffic Manager, Chesapooke & Chia Rollway Company, Terminal Years, Clevaland J. Obio.

Chesapeake and Ohio Railway

WORLD'S LARGEST CARRIER



OF BITUMINOUS COAL



ORLANDO PLANT PACKS 24 MILLION CANS OF FROZEN FRUIT FRICKS 124 MILLION CANS OF JUICES WITH

The Southern Fruit Distributors use five large Frick ammonia compressors in their new Florida processing plant. These machines give a four-fold service: evaporating citrus juices in a heat-pump cycle, chilling juices and pulp later added to the concentrate, quick-freezing the final product, and storing the frozen cans at zero.

When you need dependable refrigeration or air conditioning, look to Frick engineers for complete service. We design, manufacture, install and maintain systems, either with the cooperation of your contractors, or on a direct basis. Let us quote on your requirements now.



Above: Booster and Second-stage Compressors Handle Low Temperatures Most Economically at Orlando Plant.

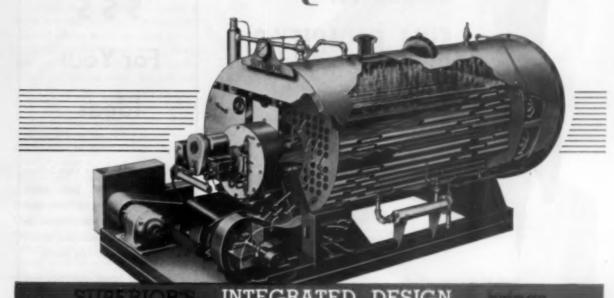
Right: Four-cylinder Compressor with 700hp. Motor, on Heat-pump Service.





MAXIMUM

HEAT TRANSFER
STEAM RELEASE
LIFE



the THREE KEYS to LOW COST STEAM



Superior Steam Generators burn oil or gas or both; are available in 18 sizes from 20 to 600 b.h.p. and pressures to 250 p.s.l. or for hot water. Write today for complete details in Catalog 711. Integrated design is one of the most important advantages of completely packaged Superior Steam Generators. Components of these units are designed and built to operate efficiently with one another. This careful sixing and matching of burner capacity, heating surface, steam space and evaporating surface, eliminates the danger of waste due to excessive stack temperatures, or wet steam which results from surging and foaming in restricted space on the water side.

Bigger, heavier, more thoroughly engineered Superior Steam Generators provide the most steam per dollar over a longer serviceable life.

for performance you can BANK on

SUPERIOR COMBUSTION INDUSTRIES INC. TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.





put the powerful
Ingersoll-Rand

MOTORPUMP

on the job!

You can get delivery from 5 to 2800 gallons per minute from Ingersoll-Rand Motorpumps—yet the largest unit requires only about 5' x 2' in floor space! They're designed and built to give you maximum performance with space-saving compactness you'll welcome.

They're exceptionally versatile, too. They operate in any position without need for a baseplate or special mounting. Nor is a coupling required, because the motor's heavy-duty shaft is connected directly to the pumping unit.

If you want smooth operation from pumps that promise lowest maintenance costs in the field, get more detailed information by writing for our latest Motorpump bulletin showing size 1/4-75 hp.

Ingersoll-Rand



\$ \$ \$ For Your Ideas

SP&I's "Helping the Man-in-the-Plant" department (see page 62) features, ideas, methods and gadgets — many plant-tested in Southern and Southwestern industrial, power and service plants.

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

Southern Power & Industry 806 Peachtree St., N.E. Atlanta 5, Georgia



It doesn't cost a cent to get advice that may save you thousands of dollars

I'm a National Tube engineer. One of the most important duties I have is to see that you get the right pipe or tubing analysis called for by your particular installation. Sure, you can use stainless steel or costly alloys for almost every job—if you don't mind throwing away money. But that's foolish, of course. You're trying to save money. You want the best tubing for the job—at the minimum cost to you. Okay—that's where I come in.

The next time you're in the market for tubing, get in touch with National Tube before you buy. We'll be glad to look over your specifications and to recommend the most suitable material for the job, at the lowest cost to you. We never lose sight of the fact that every installation is an individual problem in material selection and must be treated as such. Incidentally, our recommendation won't cost you a cent.

National Tube manufactures seamless pipe and tubing in a complete range of steel analyses from low carbon, through the alloys on up to and including the stainless steels. In addition, the widest range of sizes and wall thicknesses are available for every mechanical and pressure purpose.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION
PITTSBURGH, PA.
(Tubing Specialiss)

COLUMBIA-GENEVA STEEL BIVISION, SAN FRANCISCO PACIFIC COAST DISTRIBUTORS UNITED STATES STEEL EXPORT COMPANY, NEW YORK





NATIONAL Seamless PIPE AND TUBES

UNITED STATES STEEL



THE GILL VALVE

ANOTHER LUNKENHEIMER "FIRST"

the revolutionary new bronze valve which has broken all existing performance records!

LUNKENHEIMER THANKS ALL OF THE LEADING COMPANIES WHO COOP-ERATED IN THE FOUR-YEAR LQ600 FIELD TESTING PROGRAM

The LQ600 Valve has been tested for four years in carefully chosen "problem installations" in American industry. Despite the poor records of previous valves, there was not one single reported case of failure or leakage of an LQ600 Valve! Here are a few typical records:

THE ONE STREAK

BRONZE VALVE NEWS IN 50 YEARS!



This revolutionary bronze globe valve has set completely new performance standards in the most severe service in industry!

LQ600 gives you so much more service per dollar that you can't afford to continue using bronze globe valves that require constant repair and

Valve users, cooperating in a four-year testing program, were unable to find any service tough enough to wear out an LQ600 - or cause it to leak, even in the most severe throttling installations! This new valve is an investment - one that pays cash dividends in maintenance savings year after year!

BRINALLOY* SEATS AND DISCS make these remarkable performance records possible. This exclusive new Lunkenheimer alloy is far more

resistant to wear and corrosion than 500 Brinell Stainless Steel - even outwears case hardened Stainless Steel exceeding 1000 Brinell! There is no need for renewability. No LQ600 Valve in four years service bas required maintenance.

OTHER FEATURES - a streamlined new exterior . . . the famous Stemalloy® Stem, which far outlasts any other stem material . . . the cool, easy-to-grip Non-Slip® patented handwheel . . . durable,



high-strength bronze in body and bonnet . . . and true back-seating, permitting safe and easy repacking under pressure.

Patented allay, Trade Mark, The Lunkanheimer Co.

For more information, call your local Lunkenbeimer Distributor or write The Lunkenbeimer Company, Box 360, Cincinnati 14, Obio.

2 wks. to 2 mas.

2 mas.

"Short"

2 wks. to everal mos. 8 mos.

"Short"

6 to 12 mas.

TYPE OF SERVICE LIFE OF OTHER VALVES

125 lb. hose steaming

Water sol, blowdown 185 lb. steam blowdown

125 lb. steam blowdown

200 lb. steam water Throttling syrup (40°F. 150 fb. thruttling 380°F.

100 lb. throttling

130 lb. threttling

110 lb. thruttling steam Scaled het water line

125 lb. thrattling steam

150 fb. steam—scale present 150 fb. throttling steam

USER COMMENT

Toughest service, provious valves leaked.

Plug valves touldn't take it. Plug valves failed every year. Pravious valve looked

year.
Previous valve locked
every run.
Previous valves tailed by
wiredrawing.
Previous valves cut.
Plug valves failed
regularly.
Plug valves senied
togularly.
Plug valves senied
togularly.
Composition seat valves
unsettisferfery.
Three other kinds failed.
About all makes windnone held up.
Plug valves failed by
wiredrawing.

Other makes failed by



BRONZE • IRON

STEEL . PVC

POSITIVE PROTECTION GREATEST ECONOMY

NEW Consolidated Safety Valve cuts cost per pound of steam discharged...has maximum capacity designed into minimum flange size...reduces size and/or number of safety valve nozzles required on any boiler...saves installation and maintenance expense.



Type 1511 is a new all-purpose Consolidated Safety Valve expressly designed for steam generator service. It's a spacesaver . . . requires less headroom and smaller discharge piping. The spring is exposed to provide stable operation and uniform blowdown control. Greater tightness is assured because of the precision lapped flat seats. Integral, double-guided combination adjusting ring and disc guide contribute to better alignment, easy blowdown adjustment and finer performance. Full range of sizes and orifices available. Get the whole operational and economy story. Bulletin 730 has complete details. Write for a copy.

SIZES: 1½" through 6". PRESSURES: Up to 250 psi. TEMPERATURES: Up to 450" F. All sizes except 6" available with oversize inlet flanges.

In Conada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

CONSOLIDATED SAFETY VALVES



A product of MANNING, MAXWELL & MOORE, INC. STRATFORD, CONN.

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'ASHCROFT' GAUGES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Cann. 'HANCOCK' VALVES, Watertown, Mass. 'CONSOLIDATED' SAFETY RELIEF VALVES, 'Cliso, Okio, Aircart' Control Products, Denbury & Stratford, Cenn. and Ingleweed, Calif. "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.



power trucks change the picture

It's necessary to change your thinking about freight elevators when you change from hand truck to power truck loading. A hand truck weighs about 500 pounds. Its relatively small pay loads are pulled into the elevator and distributed by hand. Full car loading is gradual. And the extra weight of the hand truck is unimportant. This type of traffic is easily handled by a conventional freight elevator. However, power truck loading completely changes this picture. A power truck may weigh 8,000 pounds, or more, plus its heavier pay load. It travels fast and stops quickly. Obviously, this type of traffic can be handled safely only in freight elevators and hoistways that have been specifically designed to take power truck "punishment"—as described in detail in Otis Heavy Duty Freight Elevators booklet 8-705.

easily installed for light freight

Otis Light Duty freight elevators have a semi self-supporting framework that permits installation in new and existing hoistways without reinforcing the building, or adding overhead supports, or building a penthouse. They can be used for any rise up to 35 feet at a speed of 25 feet per minute with lifting capacities of 1,500, 2,000 and 2,500 pounds. They're described in Otis booklet B-720.

protective screen of safety

Otis engineers have developed a screen of safeguards around freight elevator entrances. A modern Otis freight elevator cannot be started until all car and hoistway doors are closed, and none of them can be opened while the car is moving through the hoistway. Doors can be opened only at a landing where the car is leveling or stopped. Power-operated Otis Hoistway Doors, for new or modernized installations, are described in booklet A-389.

freight elevators up-to-date?

A modern freight elevator is an efficient, safe, production tool for reducing materials handling costs. You can have freight elevators where you want them, when you want them—with or without attendants. Our unmatched experience in all fields of elevatoring qualifies us to advise on standard use or on special adaptations of Otis freight elevators for completely automatic production lines. This experience is available for any size installation, however large—or small!

the heart of the installation

You can look to your Otis gearless hoisting machine for almost endless service. You'll never wear it out. We'll tell you why. Otis machines are not adaptations of standard commercial equipment. They're specifically designed to meet the unique requirements of elevator service. All parts are built in Otis plants under rigid quality control. Another reason why the Otis trademark is the symbol of the world's finest elevators.

OTIS ELEVATOR COMPANY, 260 11th Ave., New York 1, N.Y.
OFFICES AND SERVICE IN 295 CITIES ACROSS THE U. S. AND CANADA

directional arrows





Steam Generators of offer important savings

Advanced design features of Foster Wheeler "SC" Series Standard Steam Generators mean maximum economy of installation, operation and maintenance

FUELS: Oil or Gas

CAPACITIES: 50,000 to 150,000 lb/hr

STEAM PRESSURES: With superheat, to 1100 psi Without superheat, to 1500 psi

STEAM TEMPERATURES: Saturated to 950 F

The "SC" Series Standard Steam Generator is the latest development by Foster Wheeler toward the reduction of steam costs for manufacturing and process plants. Pre-engineered in all details and standardized for economy, the new units are available in nine sizes with maximum input of over 200 million Btu/hr.

Although dimensions and structural details are fixed, the design provides a wide choice of temperatures and pressures, 48" or 54" upper drums, balanced draft or pressurized firing, type and location of heat recovery equipment, fans and drive, and make of burners for oil or gas firing.

The advanced features of this design, some of which are noted below, contribute to low installation, operating and maintenance expense and maximum dependability under continuous, full-load operation.

- COMPLETELY WATER COOLED FURNACE with 3" OD closely spaced tubes minimizes setting maintenance and prevents excessive exit gas temperatures.
- OVER 19 FOOT FIRING DEPTH permits long horizontal flame travel with minimum of ineffective or unused furnace volume.
- FULLY DRAINABLE SUPERHEATER, available when superheat is desired, simplifies operation and eliminates a potential trouble spot.
- STEAM PURIFYING SYSTEM consisting of horizontal separators, chevron driers and dry box provides steam purity of less than 1 PPM.
- 5. EFFICIENT CONVECTION SURFACE of 2" OD tubes in a staggered, cross-flow arrangement, combines maximum heat transfer with minimum draft loss. Singlepass boiler section eliminates baffles, dead gas pockets, and further reduces maintenance and draft losses.

- UNRESTRICTED CIRCULATION Absence of headers provides free circulation through integral risers and downcomers, eliminates header handhole plates and gaskets as possible sources of leakage.
- FULL INSULATION together with the relatively close spacing of the furnace tubes, results in low casing temperatures.
- Sottom supported unit fully utilizes the structural strength of the steel tubes and provides for free expansion of all pressure parts within a stationary casing. This provides low unit stresses in all members and results in a rugged structure that is economical to erect and install.
- ALL WELDED CASING forms a rigid, pressure-tight unit. Possible sources of air and gas leakage are reduced to a minimum, thus providing lower operating costs through more efficient combustion.

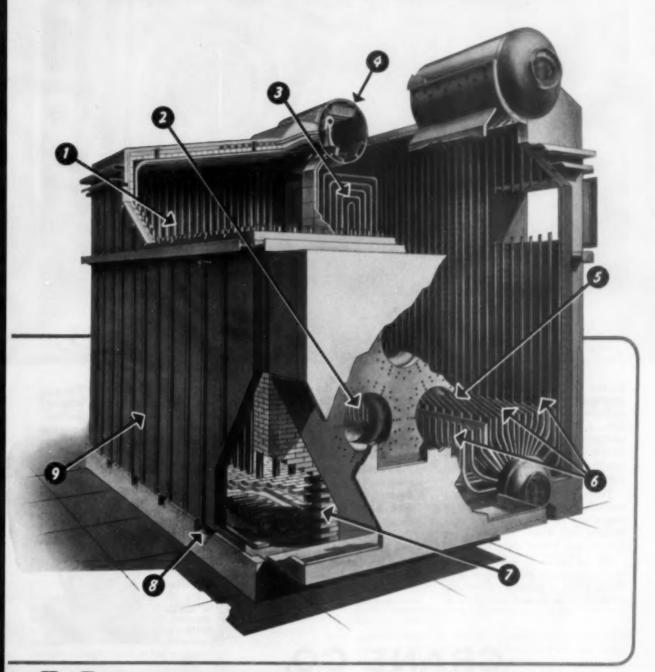
LONDON . NEW YORK
PARIS . ST. CATHARINES, ONT.



FOSTER

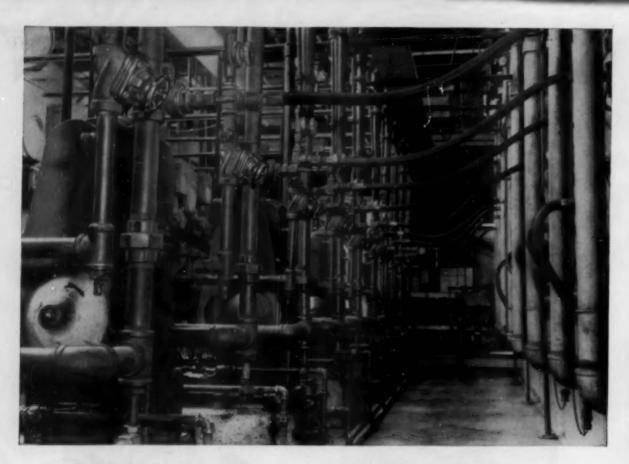
STANDARD DESIGN

in industrial steam costs



WHEELER

FOR COMPLETE INFORMATION on the "SC" steam generators, write to Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.



Holding high vacuum with low upkeep is routine for these CRANE VALVES

At the Crosley & Bendix Home Appliance Divs., Avco Mfg. Corp. refrigerator plant at Richmond, Ind., a line vacuum within a few microns of absolute is applied to a dehydration process. But holding this vacuum wasn't always a routine operation.

There was a time when frequent valve failures caused production losses and costly maintenance stopped only when Crane Packless Diaphragm Valves were installed.

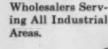
Of the valves formerly used, a multiple metal diaphragm type lasted about 3 months. Crowning of diaphragms caused restriction or closure and made the valves inoperable. Damaged diaphragms meant complete valve replacements.

In other valves, in-leakage at the diaphragm-to-stem connection made them unsatisfactory.

Now in service more than a year, none of the Crane Kel-F Diaphragm Valves has needed any maintenance. Crane simplified construction, giving a longer-life diaphragm...tighter bonnet seal and seating...and easier operation...is the reason.

The diaphragm in Crane design has longer life because it seals the bonnet only—is not subject to the cutting and crushing encountered when also used for seating. The separate, positive seating disc controls fluid even should diaphragm fail. Wide selection of body materials and trims. Ask your Crane Representative for Circular AD-1942.

Crane Co., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. Branches and







CRANE CO.

VALVES . FITTINGS . PIPE KITCHENS . PLUMBING . HEATING

CRANE'S FIRST CENTURY...1853-1955



Syracuse U. burns coal the modern way for dependable steam supply

Over the past decade, there has been a growing demand on the steam plant at Syracuse University. Not only has the university itself expanded rapidly, but six hospitals on or adjacent to the campus depend on university facilities for steam. When the original steam plant proved inadequate (total output 190,000 lbs. per hr.), the university built a completely up-to-date unit to replace it.

The internal operation of this new plant is as modern as its panel and glass exterior. An automatic handling system delivers the coal from hopper to bunker to pulverizer to boiler. A pneumatic-type integral combustion control system operates the boilers automatically. A pneumatic disposal system removes fly ash and cinder ash automatically. Today Syracuse University is assured an adequate steam supply—capacity 300,000 lbs. per hr.—and a clean, economical operation in the process.

Investigate Your Fuel Costs

If you're planning to modernize your plant or build a new one—or if you are just interested in cutting fuel costs find out how coal, burned the modern way, compares to other fuels. Why not talk to a consulting engineer or your nearest coal distributor? Their advice may save you thousands of dollars each year.

facts you should know about coal

Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar.

Automatic coal and ash handling systems can result in a virtually labor-free plant.

Coal is the safest fuel to store and use. No dust or smoke problems when coal is burned with modern equipment.

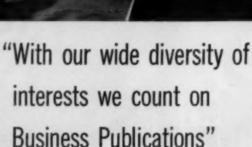
In most industrial areas, bituminous coal is the lowest-cost fuel available.

Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

> NATIONAL COAL ASSOCIATION Southern Building, Washington 5, D.C.





says

Harry A. Bullis

Chairman of the Board, General Mills, Inc.

"... to help us keep closely informed on problems ranging from the wheat field to the consumer's dining table or the industrial plant."

Without business publications, it would be a near-impossibility to keep closely informed on new developments in the many fields that affect day-to-day operations in a large, highly-diversified firm. That's why Mr. Bullis, his associates and department heads throughout his organization "count on" the timely, factual reporting of business publication editors, analysts and feature writers.

When the reader feels the editorial pages are informative and helpful to him, you can be sure he'll be impressed by your message on an advertising page, too. For advertising pages in business publications have equally specialized value. They provide a direct sales route for any product or service of benefit to business or professional men.



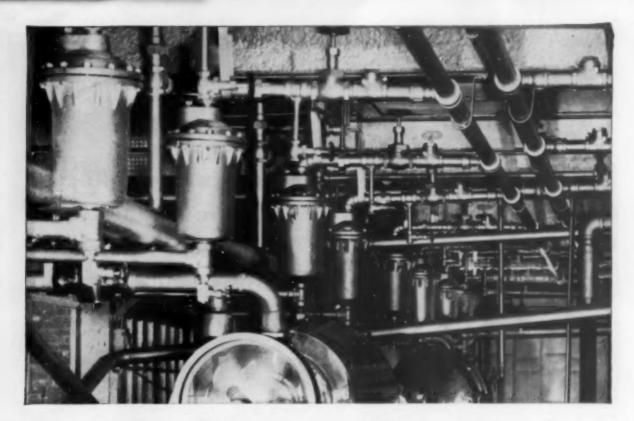
NATIONAL BUSINESS PUBLICATIONS, INC. 1001 Fifteeath Street, N. W., Washington 5, D. C. . STorling 3-7535

The national association of publishers of 173 technical, professional, scientific, industrial, merchandising and marketing magazines, having a combined circulation of 4,098,937... audited by either the Audit Bureau of Circulations or Business Publications Audit of Circulation, Inc... serving and promoting the Business Press of America... bringing thousands of pages of specialized know-how and advertising to the men who make

decisions in the businesses, industries, sciences and professions...pin-pointing the market of your choice.

Write for list of NBP publications and the latest "Here's How" booklet, "How Well Will We Have to Sell Tomorrow?", by Ralston B. Reid, Advertising & Sales Promotion Manager, Apparatus Sales Division, General Electric Company, Schenectady, N. Y.





How To Increase Production and Still Use Less Fuel!

Problem—Cooking kettles at National Cranberry Company, South Hanson, Mass., couldn't produce enough to supply three recently speeded up canning lines. There was neither enough space nor steam supply capacity to add more kettles. Might there be another answer?

Solution—Mr. Russell Appling, Production Manager, made a very logical move, with everything to gain and nothing to lose. He called his local Armstrong Representative to talk about re-trapping his set-up. The existing traps were replaced with Armstrong 2" No. 216 large vent traps, one on each of the 8 kettles. Additionally, the steam lines were trapped to assure a dry steam supply.

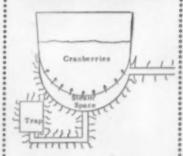
Results - 30% more kettle production. A fourth canning line was added to keep up with output. And, fuel consumption dropped 30% despite the production increase!

If you want more efficient production, greater return on equipment investment, why not call your Armstrong Representative. See your classified phone directory or Thomas Register, or write:

ARMSTRONG MACHINE WORKS 806 Maple Street, Three Rivers, Michigan



HOW A KETTLE CAN GIVE 30% MORE OUTPUT WITH 30% LESS FUEL



Assume that with trap "X", Inadequate for the job, cooking time is 10 minutes. During that period heat is radiating (wavy lines) from supply lines, kettle and trap. This non-productive heat loss wastes steam. Now, with an Armstrong trap keeping the steam space free of air and condensate, heat transfer rate is fast and cooking is done in 6 minutes. Thus, four minutes of non-productive radiation loss is eliminated—the faster cooking actually saves steam.



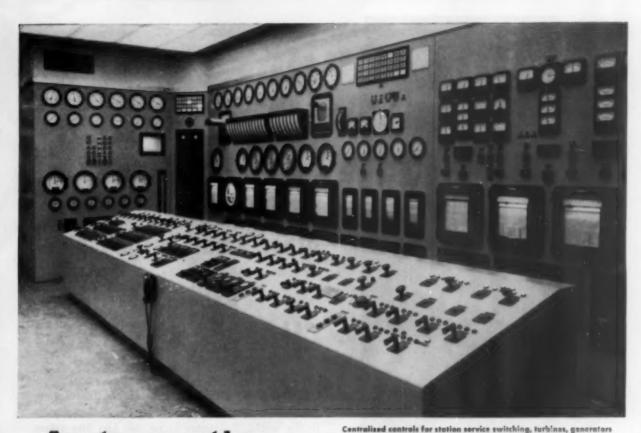
Operating Boilers
Electronically at
Alabama Power
Company's NEW
BARRY PLANT

"On the line" since early 1954, the new Barry Steam Plant near Mobile, Alabama adds 250,000 kw to Alabama Power Company's expanding system. Plans provide for the possible enlargement of the plant to 1,000,000 kw capacity.

REPUBLIC



REPUBLIC FLOW METERS CO.



Automatic and beliefs are in this reem. Republic sub-penels on the bench board provide for either automatic ar manual control of the boilers. Combustion Controls

At the new Barry Steam Plant, two 900,000 lbs. per hour pulverized coal fired boilers operating at 1875 psi and 1000°F. are controlled by a Republic Electronic Master Combustion Control System.

Electronic impulses control pneumatically operated fuel, draft, and feedwater regulators on the boilers. Master control signals are transmitted practically instantaneously, permitting fast control response and close boiler control.

To ensure that both final firing rate and air flow will rapidly and accurately follow changes in steam load, the control system normally follows a dual element master control. This master controls the boiler auxiliaries from a rapid and proportional steam flow function together with a stabilized steam pressure function. Such a system combines the features of derivative control with automatic correction for fuel variation in such a manner that the effects of load swings are minimized almost to the vanishing point. Other control

problems such as feedwater control and steam temperature control are simplified by the coordination of boiler auxiliary functions due to this system of combustion control.

Republic boiler feedwater is controlled automatically by a three-element feedwater control. To prevent heat damage to feedwater pumps during low flows, a Republic pump by-pass system has been installed. It automatically maintains a minimum flow of 125 gpm through each pump (two pumps per boiler) returning by-passed water to the deaerating heater storage tank.

Final efficiency tests recently completed at the Barry plant indicate the expected plant heat rate has been fully realized. There are Republic Automatic Combustion Control Systems—electronic or pneumatic—for all sizes and types of boilers, all methods of fuel firing and for any arrangement of draft equipment. For full details, write today.

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and trouble-free over long periods. Stemand-gate connection is extra strong where extreme stresses can develop.

For every application you have for small forged steel gate valves, specify Chapman List 960. Sizes from 1/4" to 2". Rising stem with yoke (shown) or rising stem with inside screw. Metal-to-metal or gasketed bonnet joint, depending on application. Pressure range to 2000 pounds at 100°F, to 380 pounds at 1000°F. For higher pressures, specify List 990. Write for your copy of Catalog 10 now.

The Chapman Valve Manufacturing Co.
INDIAN ORCHARD, MASSACHUSETTS

TIMELY COMMENTS



30 Per Cent by 1965

THE industrial surge in the South and Southwest is largely the product of research and includes such technical operations as the production of petrochemicals, synthetic fibers, and light metals, which owe their existence to the laboratory.

Dr. Frank J. Soday, vice president of research & development, The Chemstrand Corporation, Decatur, Alabama, recently emphasized that while much of this basic research has been carried out in the North, it is plunging the South into an advanced state of technology. In this challenging climate, the South is beginning to build its own research and development facilities to insure its future growth, and to maintain its leadership in the highly technical industrial operations which play so prominent a part in Southern economy.

Its Own Best Customer

The South is engaged in two revolutions at the same time. Still in the midst of its industrial revolution, it has started a marketing revolution which may have an even more lasting effect upon its future development. The balanced economy achieved by blending diversified agriculture with industry has greatly increased the per capita income and the general prosperity of the region. The implications of this growth from a marketing standpoint are obvious. The South is rapidly becoming its own best customer.

Manufacturing in 1965

The South's proportion of the nation's manufacturing facilities has increased from 9% in 1900 to nearly 25% in 1954. Of the \$26 billion expended by the government and private industry for wartime construction, \$4.5 billion was spent in the South, which served to double the area's industrial plant capacity.

At the height of the building boom following World War II, an average of one new, multimillion dollar plant started operation in the South each working day of the year, and this rate was maintained for a period of nearly three years. Today, the South has over 15,000 manufacturing establishments employing 50 or

more workers. Its industrial output has increased from \$11 billion in 1939 to \$60 billion in 1953.

In view of the rapid expansion of industry in the South in recent years, Dr. Soday predicts that the South will have 30% of the country's manufacturing facilities by 1965. In order to do so, he states that it will be necessary to build approximately three plants per day during this period, or a total of 10,000 plants in 10 years. Each state, on an average, will add 700 plants to its industrial potential by 1965.

We Are Betting on Chemicals

To many Southerners the pot of gold at the end of the rainbow looks remarkably like a test tube. The South is betting on chemicals in a big way. While industry in general is expanding at the rate of some 3% per year, the expansion in the field of industrial chemicals over the past decade has been twice as rapid. At the present time, the chemical industry accounts for at least 20% of all industrial production in the United States.

More than half of the nation's new chemical plants have located in the South and Southwest in the last few years. The South has one-third of the nation's chemical industry, and it is expected that this will increase to one-half within the next 10 years. The majority of the chemical industry undoubtedly will be located in the South by 1975.

Watch Petrochemicals

Petrochemicals are the backbone of the Southern chemical industry, and over 80% of all of the petrochemical plants in the country are located in the South, particularly along the Texas-Louisiana Gulf Coast. Petrochemicals are derived from petroleum and natural gas, the South's most important mineral products. They account for over 25% of all of the chemicals produced in this country today, and it is expected that this will increase to 50% within the next decade. These are rapid strides for an industry established only 25 years ago.

The production of petrochemicals will increase from 10 million tons annually in 1955 to 27 million tons in 1975. The additional plants required for this increased production will cost 5 billion dollars, and the majority of these plants undoubtedly will be constructed in the South.



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INDUSTRY SPEAKS

SOUTHERN POWER

Multi-Million Dollar Electric Controls Plant — Waynesboro, Virginia

DR. L. T. RADER, general manager of the General Electric Company's Specialty Control Department, speaking at the dedication of the department's new multi-million dollar plant in Waynesboro, Virginia, emphasized that this is the first new industrial facility of its size ever built for the specific purpose of producing electronic controls for use on mechanized production lines. He cited this as dramatic evidence that the trend towards automated production in industry will result in an even stronger and healthier economy, with more jobs and increased prosperity. The following comments are abstracted from his speech.

THIS new plant was built specifically to meet the growing demand for electronic controls used in automated processes. As a direct result, we have built a plant which will eventually employ between 500 and 600 people with an annual payroll of approximately \$21/2 million. It is of added interest that one out of three of these people will be in the engineering function of our production. By 1957 the department expects to be spending an additional \$1 million annually in Virginia for materials, utilities, and supplies. Plans for future plant expansion are already being prepared, although this installation is not yet operating at full capacity.

Products manufactured at the new plant, which will be the department's headquarters, range from thumb-size relays for aircraft, to complex programming systems that automatically control the operations of giant 100-ton punch presses. Other products include ultrasonic generators, which produce sound waves beyond the range of human hearing, used to clean miniature parts, and pinhole detectors, which can spot a flaw in a sheet of steel moving at 60 miles an hour.

These controls are vital components of high-speed production lines, detecting and correcting flaws, controlling production, and co-ordinating intricate machinery in less time than it takes for a man to see a red light and push a button. As we have seen here, this leads to more jobs in producing this type of equipment, and to better jobs in its utilization in production lines, since it relieves man of more monotonous chores and frees him for more creative and interesting work.

Established in 1953, the company's Specialty Control Department initially had its headquarters in Schenectady, N. Y. But due to the anticipated growth in the use of electronic controls, the department announced its new location that same year, and in March, 1954, broke ground in Waynesboro for its new plant.

While a major portion of the company's expansion and modernization, will continue at its established locations, part of the company's growth is

also taking place in the South and Midwest. These areas are providing growing markets for electrical products. Factors in selection of new plant sites, are nearness to market, availability of personnel, and opportunity to grow to meet future demand.

Containing 190,000 sq ft of floor space, the ultra-modern plant has air-conditioned affices and a completely equipped product development laboratory.

A major feature of the plant's design is its flexibility. The complete plant can be reorganized with new production lines and a new layout within two weeks. All machinery is free standing, including presses, brakes, lathes, and mills—with no in-floor bolting. Connections for water, air, and power are made to overhead supplies with flexible couplings.

A uni-directional production flow has been achieved, despite the custom-engineered nature of many of the department's products. Standard and special parts for a complete assembly are put on specially designed conveyor carts, then towed by overhead conveyor to individual work stations, thus eliminating parts stocking at work stations and simplifying assembly techniques.

Also an integral part of the plant's production flexibility is a special punched card system. This co-ordinates and records inventory, stocking, assembly, piece work credit, schedule, delivery and other functions, of both standard and special components, as well as the completed assembly.

Speed and flexibility have been designed into office operation. A telephone dictation system, one of the first of its kind in the country, utilizes a central stenographic bureau. To dictate a letter, office personnel dial a single numeral on a standard telephone, which automatically connects them with a transcribing machine in the central bureau. Corrections are noted with another dialed numeral, as well as the end of the letter. At the central bureau, relays shunt incoming calls to idle machines and also signal when a given machine's recording surface should be changed.



Aerial View of Kirby's Pine Lumber Mill, Silsbee, Texas.

Texas "waste" makes power and pulp . .

POWER FOR A GIANT LUMBER MILL

By RICHARD B. ROBERTSON

Partner
H. E. Bovay, Jr., Consulting Engineers
Houston, Texas

THE KIRBY Lumber Corporation Mill at Silsbee, Texas, is one of the largest and perhaps the most modern pine lumber mill in the United States, Conceived by J. K. Herndon, Vice-President of Kirby, and designed by H. E. Bovay, Jr., Consulting Engineers, of Houston, Texas, the plant is completely electrified and has the

latest equipment for manufac-

turing finished lumber from rough

The facilities include ponds for underwater storage of barked logs, hydraulic barkers, a sawmill with four double cutting bandmills, electric motor drives for the log carriages, chippers, mechanical edge sorters, stackers, dry kilns for the entire production, unstackers, surfacers, high bay crane type storage shed and shipping buildings. The planing mill has three main production lines and several specialty production lines. The mill is designed to produce 75 million board feet per year of Southern Yellow Pine products.

The mill is self-powered with the exception of a natural gas tie-in for supplementary fuel and emergencies. The power plant for a mill such as this is an outstanding facility in itself. It furnishes electrical power, steam and compressed air for the operation of the lumber mill by burning mill residue consisting of hogged wood waste, bark, trimmings and shavings and sawdust from the sawmill, rough mill and planing mill.

Capacity Requirements

Many months of studying, tabulating and economic analyzing were required to establish (1) the capacity required of the Power Plant, (2) the most economical power mediums to be used to operate the machinery and (3) the best physical characteristics such as temperature and pressure for steam and voltage and distribution systems for electrical power.

Good efficiency of the power plant is necessary to permit the sale of wood chips to pulp mills without having to supplement the fuel supply to the power plant with outside fuel. Thus, the revenue obtained from the sale of chips does not have fuel charges against it, and yet the lumber mill provides all of its own fuel for normal operation.

The main factors employed in

establishing the capacity of the Power Plant were the steam requirements for the dry kilns and the determination of whether it would be more economical to use steam shot-gun or electric motor driven log carriages in the sawmill. After considerable test work and calculating, it was indicated that an appreciable savings could be made in operating costs and initial power plant investment by using electric motor driven log carriages. Once this had been decided, it was then necessary to make a detailed listing of electrical power requirements throughout the mill to determine the turbine generator capacity required. A total of over 10,000 hp of electric motors is installed in the plant.

Steam Pressure

The next step was to establish the most economical steam pressure to be used in both the power plant and dry kilns, since these were the chief users. Heat balances and steam calculations were formulated using various initial pressures and extraction pressures for the turbine generators, with the extraction steam being used primarily for heating of the dry kilns.

As a result of these studies and calculations, it was established that the power plant should have a steam capacity for an expected load of 120,000 lb/hr and an electrical power capacity to meet a normal requirement of 5500 kw at 4160 volts.

To assure stand-by capacity for continued operation of the lumber mill in event of the loss of any major power unit in the plant, it was decided to install two boilers of 100,000 lb/hr capacity each and two turbine generators with 3500 kw generating capacity each.

Equipment of this size was se-

sirable so the boilers would normally be operated at reduced load with resulting low maintenance costs and longer life. Steam is generated at 600 psig, 750 FTT. The relationship of the major items of equipment is shown on the accompanying flow sheet.

Boilers and Auxiliaries

The boilers were purchased from Combustion Engineering, Inc., and are VU-40 type, two-drum bent tube construction with water cooled furnace walls and roof and high set spreader stokers with travelling grates. Each boiler is capable of generating 100,000 lb/hr when burning wood, but each is also equipped with corner fired tilting gas burners and has

reinjected into the boilers by steam and deposited upon the travelling grates below the overfire air system.

The boilers are provided with American Blower forced draft and induced draft fans. The ductwork from the forced draft fans supplies air to the gas burner boxes or below the grates and to the over-fire air system.

The over-fire air system consists of a series of curved pipes which leave the air ducts and enter the four corners of the boiler in order to provide a large number of air jets in the furnace above the grate and under the spreader stoker distributor.

These jets create a highly turbulent area in the furnace and assist in burning the wood wastes efficiently while still in suspension and with very little carry over of fly ash from the boilers.

The flue gases from each boiler pass through individual air preheaters, dust collectors, induced draft fans and then to individual stacks which are 85 feet tall, 78 inches in diameter, completely self-supporting and designed to withstand the hurricane wind loads that are experienced on the

High efficiency power plant (six hundred pound pressure) gives economies in wood waste burning that allows sale of wood chips to pulp mills.

lected and justified in this instance since it was more economical to build stand-by capacity into the power plant than to pay for an inter-connection and stand-by charges from a public utility. The boiler size selected was also dea capacity of 125,000 lb/hr when burning only natural gas.

The boilers have Elesco superheaters, Combustion Engineering tubular type preheaters and Pratt-Daniel dust collectors. The fly ash from the dust collectors is

View of power plant from boiler side with fuel vault at left.





Standing in front of the Westinghouse switchgear, from left to right: R. B. Robertson of H. E. Bovay, Jr., Consulting Engineers; A. W. Dainwood, General Superintendent, James F. Lee, Power Plant Foreman, and C. G. Onstad, Maintenance Superintendent, for Kirby Lumber Corporation.

Gulf Coast. The induced draft fans are turbine driven while the forced draft fans are electric motor driven.

Turbine Generators

All electrical equipment in the mill was furnished by Westinghouse Electric Corporation.

The two identical turbine generator sets installed have a generating capacity of 3500 kw each at .8 power factor and 3600 rpm, generating power at 3 phase, 60 cycle, 4160 volts. The generators are air cooled and have direct connected exciters.

The turbines have an inlet steam pressure of 600 psig, 750 F., with an extraction steam pressure of 25 psig and operate condensing at 2.61 inches of mercury absolute pressure. The Westinghouse condensers are two-pass type served by Worthington circulating pumps and Fluor Corporation two-cell forced draft cooling towers.

All pumps in the power plant were furnished by the Worthington Corporation. The boiler feed pumps are horizontal split case, 6-stage centrifugal pumps capable of delivering 300 gpm each at 750 psig and have a total head of 1700 feet. All pumps are in pairs—each pump being capable of handling the entire requirement. One pump in each pair is steam turbine driven and the other motor driven.

The boiler feed pumps take suction from a de-aerating feed water heater manufactured by the Swartwout Company. The heater capacity is 125,000 lb/hr. It is an atomizing spray type heater operating at 25 psig steam pressure and supplies feed water to the boiler at 240 F.

Steam System

The entire steam system for the power plant and lumber mill is a closed system that is expected to operate ultimately with a make-up requirement of 2 to 3%. This make-up is supplied by a Lummus Company evaporator with a continuous capacity of 6,000 lb/hr and a maximum capacity of 12,000 lb/hr.

This evaporator is connected in a unique fashion in that steam to the evaporator is supplied at 125 psig and discharged to the condensate tanks, while the evaporated steam at 25 psig is exhausted into the 25 psig steam header to supplement the steam to the dry kilns. Since the dry kilns operate seven days a week, twenty-four hours a day, this eliminates the need for an evaporator-condenser.

Any additional feed water treatment required is provided by direct injection of chemicals into the boiler drums by Milton Roy chemical pumps which also provide control of boiler water pH.

Transformers and Switchgear

The power plant switchgear furnished by Westinghouse consists of eleven units and includes two generator breakers and six feeder breakers. These circuit breakers have an interrupting capacity of 150,000 kva.

In connection with the switchgear, there is a dual remote control unit located in the power plant control room which is centrally located between the two boilers and two turbines.

The power plant has one 500 kva, 4160-480 volt, 3 phase, 60 cycle transformer substation which supplies power to the 480 volt auxiliaries. A 4160 volt motor control center controls the 200 hp boiler feed pump induction motor and two 350 hp synchronous motors which drive the air compressors. There are three 480 volt motor control centers with the starters for the remaining power plant equipment.

Electrical Feeders

Of the six 4160 volt feeder breakers, one serves the auxiliaries in the power plant, and the other five serve the rest of the lumber mill. These five feeders utilize aerial cable rather than open wire lines due to the proximity of structures around the power plant, and the fact that aerial cable offers a high degree of lightning protection.

Feeders 1 and 2 serve the north end of the plant, including the edge sorters, kilns, cooling sheds, rough mill, rough storage, planer and shipping buildings. Feeders 3 and 4 serve the sawmill area and barker area, and Feeder 5 serves the shops, street lighting, office and miscellaneous power consumers. Unit power centers are located indoors in each building or

area where loads are concentrated.

The power centers step the voltage down to 480 volts from 4160 volts, and feeders from the power centers serve unitized motor control centers located convenient to heavy motor concentrations. All motor starters and disconnects are mounted in the control centers, providing ease of maintenance and part replacement.

Thirteen 500 kva, 3 phase, 60 cycle, unit power centers and twenty-six unitized motor control centers are used to step down and distribute the power. In addition to this, individual high voltage (4160 volt) motor starters supply two 300 hp barker motors, five 400 hp motors, two 350 hp motors, and one 200 hp motor.

Roadway lighting in the plant is provided by 400 watt mercury vapor street lighting fixtures which are mounted on the same pole used to carry power distribution lines. The log ponds are flood lighted with two 120 foot high towers, utilizing 1500 watt flood lights. Fluorescent lighting fixtures are used in general in all the buildings and supplemented by incandescent lights where required.

Air Compressors

The power plant contains two Worthington air compressors with

a rated capacity of 1650 cfm of free air, each. They are two-stage compressors with an operating pressure of 125 psig and are uriven by 350 hp, 277 rpm, 4160 volt, direct connected synchronous motors. The air from these compressors is used throughout the lumber mill for operation of air cylinders on the various pieces of equipment.

All instruments, meters, and combustion controls are electrically controlled and were furnished by the Hays Corporation. Major controls are all located in the central control room with the dual switchboard.

The system is designed for automatic or manual control and is set up so that each boiler is controlled separately. The boilers can be automatically controlled while burning either wood waste or natural gas or both fuels simultaneously. When burning both fuels simultaneously, one fuel is set at a steady rate by manual control and the other fuel takes the load swings automatically.

Semi-Outdoor

The power plant is a semi-outdoor installation with the steel cased boilers exposed to the weather, but the remainder of the installations are enclosed by a steel and corrugated as bestos building with ridge ventilators and projected windows.

The building has two main operating floors, the ground level giving access to all the pumps, compressors, condensers, evaporator, fans and ash removal system for the boiler. The second level, located 20 feet above the first, is the operating level and serves the generators, switchgear, control room and stoker distributors at the boilers. Seventeen feet above this level and immediately in front of the boilers only, is another level which supports the live bottom bins and the de-aerating feed water heater.

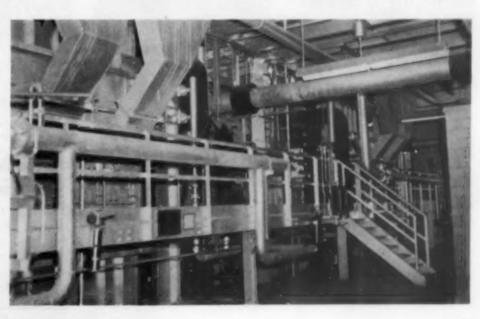
These floors are concrete and Robertson Q-floor construction within the building and along the firing aisle. All platforms around the boilers and serving intermediate levels for access to valves and piping, are steel grating.

The south bay of the power plant building away from the boilers has three floor levels at ten foot intervals providing shower room, laboratory, storage and Power Plant Superintendent's office.

Fuel Handling

Fuel is brought to the fuel storage vault of the power plant by approximately 2,000 feet of conveyors, mostly supplied by Link-Belt Corporation. Thirty inch troughing belt conveyors are used

C o m b u stion Engineering boilers, s h o w i n g chutes from live bottom bins to stokers on front of boilers.



in most instances but flight conveyors are used when space is at a premium.

The fuel is carried by the conveyors to an all steel and corrugated asbestos fuel vault with a storage capacity of 125,000 cubic feet.

This vault is of unique design and the only one of its kind in the United States. It has a sloping floor completely covered by ten drag conveyors used for removing fuel from the vault. The vault is 100 feet long and 50 feet wide and stands approximately 50 feet high. The ten floor-conveyors are run in sequence and automatically timed to give an even withdrawal of fuel from the vault in order to assure complete turn-over of fuel.

Fuel from this vault is carried by flight conveyors to the live bottom bins ahead of the boilers. Each of these two bins contains 12 screw type conveyors which cover the entire floor of the bin and feed the fuel out into a chute which drops to the stoker distributors on the front of the boilers. The floor screws have variable speed ratio of 6:1 and are controlled by the automatic combustion controls.

Each bin has a storage capacity of 1500 cubic feet which affords enough fuel to operate that boiler for approximately one hour at full load. These bins were manufactured by Miller-Hofft Company.

Operation and Performance

Extraction steam from the turbine generators is supplemented by a pressured reducing station to provide a maximum of 95,000 lb/hr of steam for the dry kilns, shops, building heating and deaerating feed water heater.

The power plant has been designed for maximum flexibility, and the efficiency of the plant can be varied as much as 15% by operating the turbines straight condensing (instead of extracting) and pressure reducing all steam required by the kilns through a valve.

Approximately four days of fuel supply can be stored in the stor-

LEGEND
E : EVAPORATOR
G = CONDENSER
G = GENERATOR
T = TURBINE

3500 NW G T SENDER REINJES
TO PSIG - SAT.
SENDER REINJES
TO SAW WATER

25 P. S.I.G. - SAT.

15 P. S.I.G. - SAT.

17 PAP

18 P. S.I.G. - SAT.

Power plant flow sheet for pine lumber mill of Kirby Lumber Corporation, Silsbee, Texas.

age vault and this will permit operation of the power plant at reduced load throughout vacation periods on wood waste only. In emergency, the boilers can be quickly shifted to natural gas by which stand-by capacity is provided.

Stand-by capacity is also provided in the turbine generators in that ir the event of loss of one unit, the other turbine generator, capable of delivering over 4000 kw at higher power factor, can carry the entire load of the lumber mill with the exception of the barking operation. In this event, the two 800 hp barker pumps would not be run during the peak load of the first shift.

Since storage capacity of barked logs is provided in the ponds, the mill can continue to operate at full capacity two shifts per day as designed, even with a major failure of either a turbine generator or a boiler.

Part of the plant flexibility is carried out also in the expansion arrangements which provide easy addition of another turbine generator or boiler without disrupting plant operation.

The Bulletin Board for Southern Industry

Southern & Southwestern manufacturers offer free literature on their latest developments in equipment and supplies.

See Pages 92-93

Florida Pumps Guard Against Flood and Drought

ONE of the world's largest pumping stations has gone into service as the heart of a gigantic flood-control system. Located at 20-Mile Bend, mid-way between Lake Okeechobee and West Palm Beach, Florida, the new station houses six 116-inch Fairbanks-Morse horizontal axial-flow propeller pumps, each with capacity of 360,000 gpm.

The combined capacity of 2,160,-000 gpm makes this the world's largest low-lift pump plant.

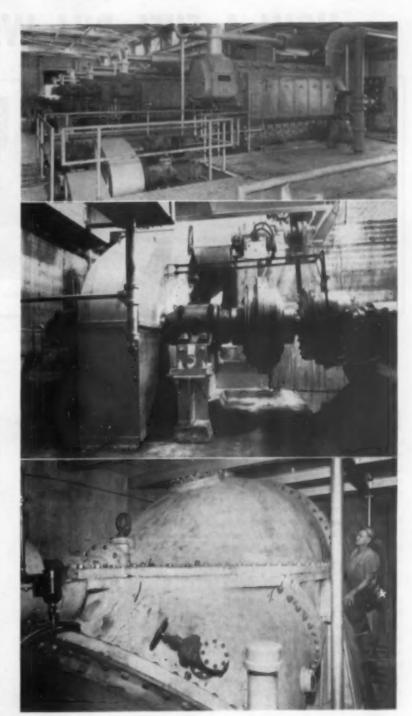
Each of the Florida pumps is driven by a 1600 hp Fairbanks-Morse opposed-piston diesel, making this also the world's largest self-powered pumping station.

The pumps are rated on the basis of a static head of 11.1 ft. The six pumps were provided with automatic-closing, semi-buoyant discharge gates to prevent backflow. Each gate has three horizontal shutters of cellular construction which open easily in sequence when a pump is started, minimizing back pressure.

Diesels were chosen to drive the big pumps primarily to insure continuity of operation during storm periods when the plant would be most urgently needed and when electric power transmission lines would be most vulnerable. Also, the power and efficiency characteristics of diesels suited them admirably to operate axial-flow pumps at variable speeds.

Still another factor was the operating economy of diesels in a plant where annual service equivalent to 52 days of full-capacity pumping is anticipated. With purchased power for electric motors, demand charges would represent a sizeable expenditure.

The engines are 10-cylinder Fairbanks-Morse opposed-piston diesels of 8½-in. bore and 10-in. stroke, rated at 1600 hp each at 720 rpm. Each engine drives its pump at a rated speed of 124 rpm through double-reduction chain drives with a ratio of 5.80 to 1.



UPPER—Six 1600 hp opposed-piston diesels drive pumps through chains.

CENTER—Chain drives with flexible couplings and thrust bearings.

LOWER—Six 360,000 gpm, horizontal, axial-flow pumps, 11.1 ft head.

HOW A FUEL BILL WAS CUT

HOW COMBUSTION WAS IMPROVED

- Smoke density decreased from #4 Ringelmann (80% density) to #1 Ringelmann (a light gray haze)
- (2) CO₂ of the flue gases increased from 6.0—8.0% to 12.5—14.0%
- (3) CO decreased from over 2% to approximately zero
- (4) Clinkering and slagging troubles were greatly reduced
- (5) Excess air could be maintained at 26-30% which was as low as desired in connection with control of refractory maintenance.



Slagging due to wrong fuel-air mixing

By HARRY M. SPRING, JR.

Consulting Engineer
Mathis Water Treating, Co., Knoxville, Tenn.

MOST SPI readers are fully aware of the fact that efficiency of steam generation depends largely on proper transfer of heat liberated by combustion and absorption of this heat by the boiler water.

Much attention has been directed to losses from impeding this heat transfer, such as from soot deposits on the fire-side and build-up of scale on the water-side of a boiler.

Possibly, not quite as much thought has been focussed on capture of this heat once it has been liberated. In plant design, engineers may plan installation of economizers and/or air preheaters to capture waste heat that otherwise would pass uselessly up the stack. Also, they invariably specify some sort of automatic combustion control.

Case Study

This brings us to two factors in a certain boiler plant that when

corrected, resulted in important savings in the fuel bill. One or both of these may well exist in other plants. Both of these conditions are illustrated by Figure 1.

The savings and changes described occurred in a steam plant having installed three 600 psig water-tube boilers, each with a rated capacity of 100,000 lb per hr and fired by spreader stokers.

The savings resulted from a direct increase in over-all boiler efficiency of 1.0 to 2.0% depending on the load.

In analyzing the first of the two changes, let's think about the difference between "combustion control" and "controlled combustion." There are a number of reputable manufacturers of equipment designed to maintain a fuel-air ratio or a steam flow-air flow to provide efficient operation. A combination of both may be used and there may be a master control that anticipates need for more fuel by metering an increase in steam flow, as

such; or by responding to slight drop in steam pressure.

It is not necessary here, to describe the intricacies of the various supplementary controls. Figure 2 shows the basic principle of the fuel-air ratio control used at the plant described by this article. Here, air flow is measured by pressure drop of the gases resulting from friction between two points.

Wrong Pressure Drop

Originally, the points were at "X-X", Figure 1. On decreasing steam flow and attendant slight rise in steam pressure, supplemental controls would reduce the output of the forced and induced draft fans. The resulting drop in pressure differential of the combustion gases between X-X would permit the compression spring in Figure 2 to raise the diaphragm, raise the oil valve and by thus permitting more oil to by-pass back to storage, the oil pressure to the stoker motor would be decreased. The reverse of this cycle would take place if increased steam demand called for more fuel.

Basically, this idea was fine, but

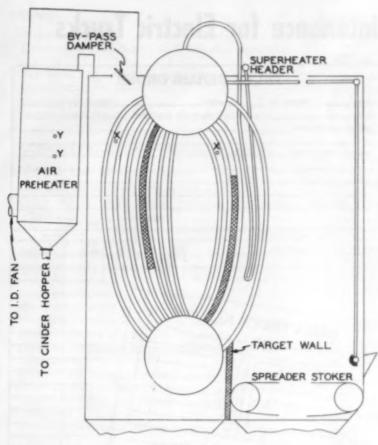


FIG. I

the characteristic curve plotted between flow of gases and pressure differential between X-X showed that at one particular boiler load only, would the air flow be the optimum.

Included with this installation were recording charts on which air-flow and steam-flow pens should be approximately together over a wide range of boiler load. Performance of the controls was about as erratic as any ever investigated by the author.

At some loads, the coal feed would not respond with changes in air flow and there would be several hundred per cent excess air. At other loads, the steam flow pen (responding to coal feed) would so far exceed the air flow that about every imaginable difficulty occurred from slagging, clinkering and smoke to unique profanity by the operators.

Working in conjunction with the stoker manufacturer the author had the diaphragm connections (Figure 2) changed from points X-X in the boiler to points

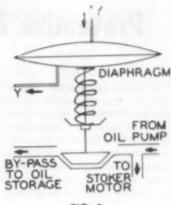
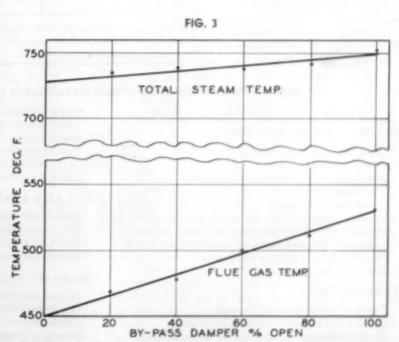


FIG. 2

Y-Y in the preheater, Figure 1. The goal was a maximum differential of 1" $\rm H_2O$ across the diaphragm at full load. It was found after several trials with the particular type of tubular air preheater installed, a 20" separation between points Y-Y provided the desired friction drop in gas pressure.

As a result of this change, the air-flow pen would follow changes in steam flow in a matter of several seconds. Improvements in combustion resulting from these changes are tabulated at the head of this article.

The second stage in this boiler efficiency program was even more (Continued on page 91)



SOUTHERN POWER & INDUSTRY for JULY, 1955

Preventive Maintenance for Electric Trucks

THE following is a list of pre-ventive maintenance check points which will adequately cover almost any type of electric-powered truck. It is based on the maintenance needs for a truck operating under average plant conditions. If your operating conditions are light, greater time can be allowed between inspections. If your conditions are severe, inspections should be made more frequently.

The manufacturer of your trucks can help you adjust your inspection schedule to suit your own particular requirements. Keep in mind that certain industrial truck applications place an undue strain on certain parts of the truck. In this case it may become necessary to inspect these heavily worked parts more often.

Since the check list is designed to cover a variety of electric truck types each schedule is divided into a general section covering points to check on all types of trucks, plus a list of additional items applying to a specific type of truck. Be sure to include all the check points shown on the previous schedule as well as those shown on the later schedule, i.e., after 1000 hours of operation check those points shown on schedules A and B in addition to those shown on schedule C.

Courtesy Elwell-Parker Elec. Co.

		TRU	CK REP	AIR (ORL	ER			
DATE.		TRUCK NO	MAKE_				SERIAL NO.		
				LAST PREVIOUS INSPECTION.					
DEIVE	E'S CO	MPLAINT							
SEPAT	E ENST	ELECTIONS							
_									
				21	CNED-	_	Spervisor		
		rts and Material Used		L		-	Clock Number	laqui red	
art No.	Qty.	Description		Price	Coat	Date	Nater	Heurs	
	1			11	1	1			
						- '			
-	1			-	-	7	-		
	8								
	DA	ILY TRUC	K REPO	RT SHIFT_	_				
Check Bri	NO	O,K, Def.	DEPARTMEN Check Seat Broke Tires Rhist Tile	-	Def.				
Check Bri	k skes	O.K. Def.	DEPARTMEN Check Seat Broke Tires Rhist Tile	-					
Check Bri	k skes	O.K. Def.	DEPARTMEN Check Seat Broke Tires Maist Tits	-			TOTAL		

PREVENTIVE MAINTENANCE CHECK LIST-Electric Industrial Trucks

SCHEDULE A-50 Hours Service or Weekly

GENERAL (For All Truck Types)

Check oil level in drive axle

Check service brake

Check steering for backlash or binding

Check parking brake

Check warning signal

Visually inspect frame, skirts, etc. for damage

Inspect tires for cracks, chips and other defects

Lubricate. See manufacturer's maintenance manual

Test and inspect battery receptacle.

Road test truck

FORK TRUCKS

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Check oil level in hydraulic tank Check hoist and tilt cylinders for leakage Check hydraulic hose fittings for leakage

Check pressure gauge (when used)

Check pressure adjusting switch (when used)

Check pressure check valve (when used)

Test hydraulic relief valve

Test function of attachments

Check for damaged forks

LOW-LIFT PLATFORM TRUCK

Inspect platform lift linkage

Check trail wheel bearings for lubrication and wear

Check oil level in lift mechanism

Inspect universal joints

HIGH-LIFT PLATFORM TRUCK

Inspect lift chains

Check trail wheel bearings for lubrication and wear

Check oil level in hoist mechanism

Inspect universal joints

CRANES

Inspect all cables

Check oil level in boom, hook and slew reduction units

Test boom and hook limit switches

Inspect universal joints

Check cable drums

Inspect boom for mechanical damage

SCHEDULE B-250 Hours Service or Monthly

GENERAL (For All Truck Types)

Check all points listed in Schedule A

Check oil in brake master cylinder (hydraulic brakes)

Check clearance of brake shoes (mechanical brakes)

Check oil level in steering gear housing

Check function of "dead-man" control interlock (seat or pedals)

Check horn button

Check operation of no-plug (when used)

Blow dirt out of truck with compressed air

Blow out motors with dry compressed air

Blow out controllers and contactors with dry compressed air

Blow out resistance boxes with dry compressed air Check all motors, commutator and brushes

Check controllers and contactors—Replace tips as required

Service battery—See battery maintenance instructions

FORK TRUCKS

Check hoist and tilt cylinders for excessive drift

Check chain reeving

Check strainer in hydraulic line (if used)

Check master controller for speed sequences

Check uprights and elevator carriage for strain or damage

LOW-LIFT PLATFORM TRUCKS

Check operation of controller linkage

Check steering linkage

Inspect platform for damage

HIGH-LIFT PLATFORM TRUCKS

Inspect uprights and elevator carriage

Check steering linkage

Check operation of controller linkage

Check lift mechanism brake lining

Lubricate lift chain

CRANES

Check steering linkage

Check controller linkage

Inspect slewing mechanism

Inspect boom and hook hoist mechanism

Check boom and hook hoist brake lining

Lubricate cables

SCHEDULE C-1000 Hours Service or Every Four Months

GENERAL

Adjust steering unit for minimum backlash

Check and repack wheel bearings

Check wheel bearings seals

Check all wiring for loose connections or grounds

Wash and touch up truck

Repair bent or damaged skirts, battery compartment doors, etc.

Drain and refill drive housing

Check resister grids

FORK TRUCKS

Check and service pump operating switch

Check elevator for excessive play

Check inner uprights for excessive play

Service hydraulic pump

Inspect and lubricate elevator and upright rollers

Drain, flush and refill hydraulic tank

Clean and service control valves

PLATFORM TRUCKS

Drain and refill lift mechanism housing Check and service auxiliary switches

HIGH-LIFT PLATFORM TRUCKS

Drain and refill hoist mechanism housing

Check uprights for excessive play

Check lift chain tension

Lubricate uprights and elevators

CRANES

Replace worn cables

Drain and refill slew unit housing

Drain and refill hook hoist housing

Drain and refill boom hoist housing

Inspect and lubricate slew bull gear housing

Check slew unit bearing adjustment

A Daily Truck Report, filled out by the truck operator at the start of each shift, gives the maintenance department a close check on the major operating and safety features of each truck.

An Inspection Report provides a systematic procedure for the inspection of trucks at regular intervals and is a basic essential to any preventive maintenance program.

A Truck Repair Order form provides an accurate accounting of operating costs and will simplify recording of labor and parts costs. Upon completion of a repair job the totals should be footed, labor costs determined, and the costs posted to the ledger so that annual or bi-annual truck operating costs can be easily made.

These reports will help ferret out weak spots in the preventive maintenance program. Examples of satisfactory daily report and repair order forms are shown.

Daily Reports Direct from Operators Set Stage for Inspection and Repairs

SOUTHEASTERN PIPE LINE DIESELS

Six 1600 hp diesels, driving 1310 gpm pumps in three stations, help increase maximum daily through-put of 483-mile system to 41,728 barrels.

THE SOUTHEASTERN Pipe Line Co. has expanded its 483mile system between Florida's Gulf Coast and Chattanooga, Tenn., to meet a booming demand for petroleum and petroleum products in ton diesel engines, rated 1600 hp at 720 rpm. Each engine drives 6-stage, flooded-suction, centrifugal pumps, equipped with 11\(^3\)s in. impellers and rated 1310 gpm at a discharge pressure of 1200 psig.

Powering the 1310 gpm centrifugal pumps at each new station are two 10-cylinder, Fairbanks-Morse opposed-piston diesel engines, rated 1600 hp at 720 rpm.

the industrial South. The company has constructed three pumping stations in Florida and Georgia.

The result is that, without increasing the 1200 psi pressure maximum in the six-and-eight inch line, the system's average daily through put has been increased from an average of 28,000 bbl to 38,200 bbl, with peaks reaching 41,728 bbl per day. At the indicated pressure this is considered maximum flow for the present system.

The three newest diesel pumping stations are located at Wewahitchka, Fla., River Junction, Fla., and Newton, Ga. Each of these stations is equipped with two Model 38D8-½, 10 cylinder, 8½ in. by 10 in., Fairbanks-Morse opposed-pis-

The driving arrangement for each pump includes a through-bulkhead shaft, flexible coupling, and a speed increasing gear of 1 to 6.583 ratio which steps engine speed of 575 rpm up to 3785 rpm at the pump.

The two 1600 hp diesels at each station are operated alternately, each having sufficient power to handle the station's average flow of 1650 bbl per hour. This arrangement provides each station with 100% standby capacity under normal conditions. Average suction pressure is 100 lb and average discharge pressure is 1150 lb.

The three stations went into operation on January 1, 1950, and since that time have been pumping regular and premium gasolines, diesel oil, fuel oil and kerosene on a 24-hour, around-the-clock basis. Despite the fact that they are operated at an average load of from 800 to 850 hp, the average fuel consumption of the six engines throughout this period was an estimated .37 lb of fuel per horse-power-hour.

Two motor powered pumping

List of Principal Equipment

(The following list applies to all three stations)

Main engines Fairbanks, Morse & Co., Model 38D8%.

10-cylinder, 8% x 10 opposed-piston diesel engines, rated 1600
hp at 720 rpm

Main pumps Worthington Corp.
Speed-increasing gears Worthington Corp.
Governors Woodward Governor Co.
Duplex fuel oil filters ... Commercial Filter Corp.
Fuel oil centrifuge Sharples Corp.

Fuel oil transfer pump..... Blackmer Pump Co., Inc. Lube oil transfer pump..... Blackmer Pump Co., Inc.

Lube oil centrifuge Sharples Corp.

Lube eil cooler Harrison Heater Div., Gen'l Motors Corp.

Full-flow lube oil strainer... Purolator Products, Inc. By-pass lube oil filter..... Purolator Products, Inc.

Main line plug valves..... Nordstrom

Air-intake filters Continental Air Filter, Inc. Exhaust snubbers Burgess-Manning Corp. Gauge panel Westinghouse Electric Corp.

Jacket water cooler..... Fluor Corp.

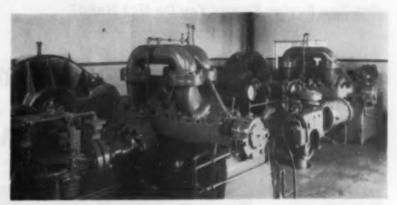
Air compressor Worthington Corp.

Diesel (driving generator).. Cummins Engine Co., Inc.

Generator Electric Machinery Mfg. Co.

Switchboard Westinghouse Electric Corp.

stations that were expanded at the same time are located at Marshallville, Ga., and Bainbridge, Ga. At Marshallville, a 300 hp motor driven pump was installed to supplement the output of a similar unit of equal capacity and at Bainbridge one of two existing 300 hp units was replaced with a 600 hp motor driven pump, the remaining 300 hp unit being retired to standby duty. As part of the same expansion program, the company doubled the capacities of the Albany, Americus, Macon and Griffin (all in Georgia) stations by operating two 300 hp motor driven pumps installed at each station simultaneously instead of alternately.



Each of the diesels drives a 6-stage, flooded-suction pump, equipped with an 11% in. diameter impeller, and rated 1310 gpm at a discharge pressure of 1200 psig. The pumps shown are driven by a through bulkhead shaft and 6.583 to 1 increaser gear and are at the Newnan, Ga., station.

Wrinkleless Bends Without Heating Tubes

M ANY operations require an array of apparatus employing coils of various sizes and shapes. As wear and corrosion take their toll, replacements become a bit expensive. With a little practice and shop built equipment the average maintenance engineer can readily build his own coils. It is suggested that flame heating be avoided insofar as possible, because excellent bends can be made if the tube is filled with a ductile material that "gives" with the metal of the tube.

We recently had occasion to develop a large number of tube bends in 1½ in. ID material to a radius of twice the OD. The stainless steel had a wall thickness of 5% of the OD size which meant that we had sufficient material for the stretching that occurs on the outer periphery. The tubing was first cleaned thoroughly to facilitate complete removal of the filler material (following bending operation).

Those tubes that appeared to resist the cleaning function were protected with a light coating of oil which prevented the filler from sticking to the inner surfaces.

The filler material used in this case was Cerrobase, a product of International Nickel Co. The tube end was sealed with rubber stop-

pers, such as any chemical store has in stock. The filler material was heated to 250 F and was funneled into the open ends and permitted to cool.

All the tubes intended for bending were upended in a rack fastened to a balcony railing from which position the filling was done with dispatch. As the group was filled, a light water spray was applied to form a homogenous mass in the tube. Voids cannot be tolerated. Each tube was cooled from the bottom upward. The cooling, contrary to the usual conception, expands the filler in this case.

The filled tubes were then transported to the fabricating shop where as each unit was readied for the hydraulic bender its temperature was brought up to 150 F to produce a ductile, uniform mass that would flex with the metal, yet would not be fully displaced.

Once all the bends were completed, the coils were immersed in a water tank equipped with steam coils to bring the water temperature up to 250 F, the melting point of the Cerrobase. A hinged cover over the tank permitted the application of a slight pressure to aid in bringing the water up to the desired temperature. Immersion for five minutes was sufficient to soften the filler liquid to a point

where compressed air forced it out with ease.

Since it is essential that all traces of oil and sulphur be completely removed from the inner surface of the tube, it was found desirable to immerse the coils in the hot tank a second time with the temperature at 200 F and water containing a 15% solution of trisodium phosphate (sodium carbonate will do). With all the tubes cleaned with the purge material, final rinsing completed the cleaning operation. The more obstinate cases required several rinses.

Method Advantages

The new technique supplants one using resin which is hard to remove completely, has a low melting point with corresponding flash fire hazard, and must be refilled because of the serious contractural effects on cooling.

Lead filling has no flash point hazards yet it is still a bad actor. The slightest trace of moisture in the tube may result in an energetic eruption. It's handling, too, is risky because of the weight and temperature.

Both lead and resin have one advantage, however. They can both be run out by applying heat with open flame torches. In fireproof quarters that is an asset.

By PAUL C. ZIEMKE, Ook Ridge, Tenn.

Organized Supply Room Cuts Costs

A Report from a North Carolina Manufacturing Company





The Central Supply Room (left) has orderly labeled bins and a competent manager who purchases all supplies. The Postindex Visible Accounting File (right) houses complete records from which value of inventory can be determined in about three hours. Information from requisition is being transfered to Postindex Cards.

SEVERAL years ago, A. M. Smyre Manufacturing Company, Gastonia, N. C., discovered that insufficient records and management were causing considerable financial loss in connection with supply inventories.

The problem was recognized, and the comptroller, M. T. Cameron, instigated a perpetual inventory system to account for all supplies. A major feature of the improved system is a new central supply room with orderly labeled bins and storage racks for different kinds of supplies required to serve the three mills at Ranlo, N. C.

How It Works

A competent man was placed in charge of the supply room, and all supplies are now purchased by the supply room manager who keeps a perpetual inventory for ready references

When a part is purchased and put in stock, the purchase order number, date received, quantity, price, and location in the supply room are all recorded on the inventory card.

When a part is requisitioned from the supply room by an overseer or section man (usually the only ones authorized), the requisition form is numbered and filed. These requisition forms are examined each day to adjust the perpetual inventory file.

Costs

Since the perpetual inventory cards also show the cost of the part, these figures are used to determine departmental supply expenses. To determine supply costs for each department, the information on requisition form and the information on the inventory card

are used to figure costs on a monthly basis. These figures are entered in a ledger. A Postindex visible accounting file is used to keep the inventory cards in order and easily accessible.

Deliveries Checked

To assure receipt of items at the mill for which purchase orders have been issued, a "Receiving Report" is made in quadruplicate upon receipt of the item at the mill. This report shows purchase order number, describes the item, and indicates the date received. One copy of this goes to the man who pays the bills, and he matches it with the purchase order before paying for the item. One copy remains in the supply room, one copy is kept in the reference file in the superintendent's office, and the fourth copy is

(Continued on page 59)

Three Miles of Conveyor Belts Carry 1,400 Tons of Coal per Hour to TVA Plant

A NETWORK of nearly three miles of rubber conveyor belts, operating in four directions at once, keeps 1,400 tons of coal an hour flowing into the nation's largest electric power producing steam plant near Paducah, Ky.

Coal tonnage carried daily by the belt system could produce the electrical power needed for a city the size of Detroit.

Manufactured and installed by The B. F. Goodrich Company Industrial Products Division, elevated sections of the belt speed overland on towers raised as high as 50 feet above the ground. The belts go up steep grades, span a river channel and road, probe underground for short runs to reach a 1,450,000-ton stockpiling area.

The multiple belt-road delivers 14,000 tons of fuel a day for the ten 150,000 kilowatt generating units at the new Tennessee Valley Authority Shawnee plant at Chiles, Kentucky. Electric power

produced at the Shawnee steam plant is fed to the gaseous diffusion plant operated by the Atomic Energy Commission at Paducah. In partial operation since early 1953, the Shawnee plant will go into full operation late in 1955 when all of its generating units will be producing for the first time.

The belt system conveys coal to the plant from Ohio river barges, north of the plant, and from railroad coal cars, south of the plant. Approaching the plant grounds, the belts can be directed to carry the coal either directly to the plant for immediate use or to a stockpile for storage. The smoothflowing maze of belts is controlled by one man at an electronic control panel.

The entire conveyor system is composed of 10 flights, or sections, of rubber conveyor belting, ranging in length from 200 feet to 2,640 feet, pulley to pulley distance. Belts are as wide as 54 inches, handle up to 1,200 tons of coal an hour and move at speeds up to 480 feet a minute. Three of the conveyor belts carry their loads up 16-degree inclines. Transfer points located where one belt flight ends and another begins automatically cause the coal to discharge from one belt to another.

From River to Plant

On the conveyor run from river to plant, the first flight of rubber belt, a 260-foot section, picks up coal from the barges which bring more than half of the coal to the plant site. A clamshell-type crane deposits the coal on the belt, through a hopper, and from there the coal is carried up hill to a transfer point located 75 feet above the initial loading point.

Here the coal is automatically loaded onto a half-mile-long conveyor belt that carries the cargo straight inland to the plant

(Continued on page 90)



Tips On

EXPLOSION-PROOF INSTALLATIONS

HOW safely an explosion-proof electrical system performs after it has been installed depends largely upon how well its various components were handled after shipment—and later—how well the assembled parts were lubricated and sealed.

Explosion-proof electrical equipment is not gas-tight, or hermetically sealed, because flammable vapors cannot be kept out of switches, conduit fittings or lighting fixtures without running up extremely high installation and maintenance costs.

The answer to such problems, according to Crouse-Hinds Company, manufacturers of explosion-proof or dust-tight electrical components, is to allow arcs to explode any vapors that seep into an explosion-proof device. To do this, however, the fitting must be rugged enough to withstand repeated internal explosions and pre-



Some sealing Condulets can be mounted in any position; others are restricted to vertical mountings. When installing seals between hazardous and non-hazardous locations, choose the correct seal for each location.

cise enough to prevent flames from escaping.

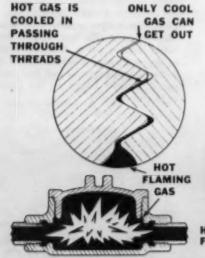
Types of Joints

Joints are of two types, threaded and ground. Both types cool exploded gases or vapors as they escape from the fitting into the atmosphere. When at least five threads of a threaded joint are fully engaged, the path of the exploded gas or vapor follows around the threads, escaping at a cool, safe temperature. In ground joint construction, the exploded gases are cooled by passing between two wide, accurately machined flanges.

Conduit fittings frequently require relubrication after storage and handling, especially in corrosive locations. If dirt or other foreign material becomes mixed with the factory applied lubricant on the threads or flanges of the fitting, it can be cleaned by using a brush or solvent, such as kerosene or Stoddard solvent. After cleaning, the joints should be covered with a light coating of an approved lubricant.

Threaded fittings should be installed with all threads of conduits and covers engaged. For ground joint fittings, all cover bolts should be pulled down evenly and tightly, but not enough to

Electrical systems are only as good as the workmanship of the installation contractors



THREADED JOINT OPENING



GROUND JOINT OPENING

strain the bolts. One loose bolt permits hot gas to escape if an explosion occurs inside the conduit fittings.

Seals

Seals limit any explosion to a single explosion-proof enclosure—prevent the passage of gases, vapors or flames from one section of conduit to another. They stop precompression or "pressure piling," the build-up of terrific pressures in the conduit system caused by successive explosions.

There are several general types of seals available.

The effectiveness of the seal depends upon it being properly filled with a compound. Some compounds withstand terrific explosion pressures without crumbling and are impervious to the effects of heat, cold or moisture. Compounds are used with a damming fiber to prevent the compound, while fluid, from leaking out of the sealing chamber.

Joints

Joints in a conduit system and its components seldom are tight enough to prevent "breathing" and

HOW TO MAKE A SEAL TO WITHSTAND EXPLOSION PRESSURES

Using damming fiber, dam each sealing conduit hub (except the one extending upward in a vertical conduit run) so that the sealing compound, while fluid, cannot leak out, then proceed as follows:

- 1. Using a wooden stick, force the rear conductors forward.
- 2. Pack fiber into each conduit hub behind the rear conductors.
- 3. Push the conductors backward and force them apart.
- 4. Pack fiber between and around the conductors in each conduit hub. If the conductors are stiff, temporary wooden wedges inserted between the conductors will be helpful. The conductors must be permanently separated from each other, so that the sealing compound will surround each conductor.
- 5. Pack fiber into each conduit hub in front of the conductors. Do not leave shreds of fiber clinging to inside walls of sealing chamber, or to the conductors. Such shreds, when imbedded in the compound, may form leakage channels. Slight dampening of the asbestos rope will make it easier to use, and prevent the shreds from clinging to the walls.
- If the conduit has a separate work opening, close the cover before pouring the seal.
- 7. Using a clean mixing vessel, mix the compound in accord with manufacturer's instructions. Underwriters' Laboratories standard for safety requires the depth of the seal to be equal to the trade size of the conduit, with a minimum of % inch. Close the pouring opening immediately after pouring the compound.

water accumulation. Alternate changes in temperature and barometric pressure cause "breathing"—the entry and circulation of air throughout the conduit system.

Moisture in the air condenses when temperature falls, thereby causing water to collect at the base of vertical conduit runs and equipment enclosures. To eliminate this condition, drain and inspection seals, equipped with explosion-proof, automatic drains, are used to bleed off the water.

Organized Supply Room in N.C. Furniture Plant

(Starts on page 56)

the audit copy which stays in the billing machine.

At the end of the fiscal year, value of supply inventory can be determined in about three hours by referring to the perpetual inventory card and adding the figures on an adding machine.

Precautions

Several mill men have examined this supply room, and their comments have been complimentary. Usually the first question asked was: "How much did it cost to initiate the system?" When told that it cost \$1500 and requires a competent full-time supply man, most mill men are frightened away by the cost before the advantages are fully appreciated.

Advantages

This system permits saving by buying in discount quantities. Also, a knowledge of parts on hand prevents having machines stand idle while trying to locate a repair part. Also, the superintendent is free from the burden of having to do all buying, meeting salesmen, and he has more time to devote to other duties. Several mills in the area occasionally borrow parts from this mill.

Many mills lose money through mistakes in invoicing and paying for items not actually received (honest errors). In one instance over \$700 was saved on overcharges for one item in this mill (mistake in bookkeeping).

Also, a ready reference record indicates when specific supplies are used in excessive quantities. Price comparisons are also readily avail-

Old Procedure

The supply room was open only

two hours a day formerly. And since there was no full-time supply man, the labor foreman issued supplies. The 3500 items in the supply room were issued at random and on demand from the various mill departments.

In some instances overseers requested too many supplies, gears, aprons, belts, and machine parts which often piled up in the departmental "store rooms." Next time a part was needed, someone went to the supply room for the part instead of using the parts already in the department.

In this way many new parts were lost or ruined from improper storage, damage, and neglect. Many parts were kept in the machine shop, including expensive bearings and similar items. These unnecessary parts represented a large financial investment which served no useful purpose.

Management officials at Smyre consider the new system worth many times more than the actual cost.

WAS IT EVER DONE?

By E. L. McDONALD, Results Engineer

Kansas City Power & Light Company Kansas City, Missouri

ODD title, I suppose, but think a moment—have all of the things you have asked others to do actually been done? Can you prove it? Do you just depend on your memory, as apparently a great number do, or do you have a follow-up system that periodically calls to your attention these numerous undone things?

In the past few years, I have inquired of many, "What follow-up system do you have?" I have found so few with any system, that writing this article seems justified.

If you have no system, you would be surprised at the number of requests for information that just die a natural death, to which you can say, "If they were important, they would not," and to which I can reply, "Your job (or mine) is not made up entirely of highly important things, but includes a lot of less important items, that if neglected, can add up to a lot of loss."

Why Needed?

Dozens of examples could be cited to prove the value of a follow-up system. For example, recently, the manager from a local organization telephoned and asked if we could lend him a temperature recording instrument for a few days, it was badly needed, and he could not find one elsewhere. We agreed. Two weeks passed, the follow-up system showed the recorder not returned. We wrote, requesting its return, and offering to continue the loan if need be. A month passed, no return. A second follow-up letter and the return of the recorder with profound apologies-the manager had told the engineer to return it a month ago; he "forgot" to do so. Obviously both of them needed a follow-up system.

Manufacturers are quite prone

to forget to reply to inquiries, especially if the inquiry is detrimental to them. If the delays are long enough, frequently the customer forgets the matter which, of course, is beneficial to the manufacturer. An example, a manufacturer failed to make guarantees on some of their equipment. They were so notified. A month, two months went by, no reply. A follow-up brought the reply that they would look into the matter. More delays, perhaps with the hopes we would forget, but the follow-up system prevented forgetting, and after almost three years of delays for various reasons, numerous follow-ups which made evident we would not forget, they ultimately furnished about \$5,000 worth of additional equipment to meet the guarantee, all of which would not have been obtained without a follow-up system.

This Method Works

And what system do we suggest? Well, for simple requests for data within your own department or company, a small $3\frac{1}{2}$ " x $8\frac{1}{2}$ " pad (see sketch) on which you write your request. Frequently, it is as brief as: "See me about testing No. 3 boiler feed pump." The individual to whom addressed discusses the matter with you, and a carbon copy of the request re-

mains in the pad. When the job is completed, the original is returned with the test data and the carbon copy checked off as completed. A similar idea is used by many on maintenance orders.

Periodically, the pad is checked to see if someone is delinquent in his reply. If so, a second request, referring to the original, usually brings results, and the fact that a follow-up system does exist, makes everyone more aware that the job must be done.

An equally simple procedure can be followed when writing to an outside company for information. A follow-up date is put on the office copy, allowing a reasonable time for a reply. The Secretary notes the date and file number on her calendar pad and brings the file to your attention on that date. If the request has not been fulfilled, you write again or set a later follow-up date. (By the way, if your file is not numerical with sub-numbers, as well as alphabetical, you are missing something, but that's another sub-

Simple, isn't it? And yet, it is unbelievable the number of otherwise capable executives who fail to have a system to periodically call to their attention things which should be done.

In a large organization, undesirable conditions can remain hidden and exist for years, costing thousands of dollars, all because some well-meaning individual forgets. Frequently, problems difficult to solve are put off until tomorrow and, of course, "tomorrow" never comes — unless you have a follow-up system.

	Date
r	
Please	return this note with information requested.
,	John Doe

Trouble Shooting on Electric Wiring

In the hotel in which I am employed difficulties crop up, from time to time, involving the electric wiring. Since these often present problems the solutions to which generally result from considerable testing, checking and plain worrying, perhaps it might be helpful to set down some of the most puzzling ones and their solutions in the hope that time may be saved for others when encountering similar situations.

Each guest room floor in this hotel is provided with a distribution panel. The permanent lights in a half-dozen or more rooms are fed from each branch lighting circuit, and the plug outlets, to which the portable lamps in a like number of rooms are connected, are fed from each branch plug circuit.

Case 1

One such trouble occurred in wiring in a guest room. All lights would light when switched on except the bath light.

Following the wiring diagram, checks were made of the wiring and switches in the room, including the ceiling light outlet box, since the diagram showed the bath light circuit being fed from this source. However, it was soon discovered that the diagram was unreliable, the wiring evidently having been installed at variance with the diagram.

Therefore, the search was carried to the other adjoining rooms, and the feed was finally traced to a light switch in an adjoining room. Here, when the wires were pulled, it was found one had burned off in the conduit (due to accumulated moisture) between the switch box and the bathroom switch box.

The defective wire was replaced with modern moisture-resisting wire and service was restored.

Case 2

Another difficulty, equally puzzling, had a comical twist.

A guest reported that his bath light could only be turned on at times. At other times it refused to light. Naturally we assumed that there was a loose wiring connection somewhere in the circuit.

Lights were disconnected, splices opened, circuit continuity checked, but no breaks were found; also no "juice" on the bath light circuit. Finally, in checking from box to box, we entered the adjoining guest room and removed the room light switch from its box. Here the trouble was discovered.

This was a two-switch combination controlling the room light and the bath light. The switch had a common feed, from which the feed for the adjoining bath room light was normally taken. However, the switch had recently been replaced, and the maintenance man had mistakenly connected the adjoining bath room light feed to the room light terminal. Hence, the guest next door could light his bath light only when the guest in this room happened to switch on his room light.

Case 3

A third problem was not quite as mysterious, but nearly as difficult to solve.

Here the light in a guest bath room failed to light at any time. The usual wiring checks and continuity tests were made on the bath room and guest room wiring, but to no avail. We therefore entered the adjoining guest room and opened the lighting circuit boxes there, tracing the circuit to the bath room light switch box in that room. Here it was discovered that a wire connected to the feed terminal of the switch had broken beneath a covering of insulated tape and was therefore not visible

at first. This wire was the feed to the light switch in the bath room next door.

Case 4

A fourth troublesome situation involved a circuit in the hotel's main kitchen. The blowing of fuses in the lighting distribution panel showed a short-circuit existing on a lighting circuit feeding a number of lights, plus a pair of radiant heat food warmers.

A 150 watt lamp was first placed in the fuse socket and this burned brightly. Then a 660 watt cone heating element from a portable glow type room heater was substituted. This permitted sufficient current to flow to cause the lights on the circuit to light dimly. Every light was checked and found to be lit in this way, thus proving that the fault did not exist on any of them. The food heaters were also disconnected from the drop cord feed, yet the short-circuit persisted.

Then one of the maintenance men examined the socket and Y-socket on the end of the drop cord and found indications of overheating of the contacts and insulation in both. The current was switched off the circuit, the defective sockets replaced with higher capacity cord connectors, and the short-circuit that had been giving trouble vanished.

Conclusions

Each of these circuit troubles taught a lesson worthwhile remembering: Never place implicit confidence in wiring diagrams unless known to be entirely correct; and don't overlook the probability that open-circuits and short-circuits are located where wiring or contacts are more likely to be disturbed, for example, at switches, sockets, fuse connections, and portable cords.

auggestion of

HELPING the MAN-IN-THE-PLANT

Ideas . . Methods . . Gadgets

New product replaces paint . .

How to Maintain New Galvanized Structures

GALVANIZING by the hot dip process, the most commonly used method for furnishing electro-chemical protection to steel surfaces, has long proved to be a very economical and trouble-free system for use on steel buildings, structures, etc. In general, the process is one where the metal surfaces are well cleaned and pickled and then dipped in a molten bath of hot zinc. On removal from this bath, excess zinc is either allowed to run off which gives a comparatively rough appearance, or it may be wiped or blown off to produce a smoother and better appearance.

The zinc coating so applied, has excellent adhesion and abrasion resistance but in handling and erection, quite often the film is damaged or broken. During construction, it is also quite general, that new holes must be punched or drilled, that long members may have to be shortened, etc. These damages, AFTER GALVANIZ-ING, expose bare iron or steel which soon rusts and causes unsightly rust streaks to run down the otherwise well protected areas.

To paint these areas when the galvanizing is new and unweathered is sometimes difficult, for the flux remaining on the new galvanizing makes it most difficult for even the best paints to properly adhere without first pretreating the galvanizing in the surrounding areas with acidic washes. Also when paint is used to touch up

these spots, an appearance results which may be blotchy and upsets the generally uniform and neat appearance of the new structure.

New Product Replaces Paint

"Galvanox" is the trade name of a new product which is being presented to fill the above needs. While it is applied in the same manner as a heavy paint and its cost is high, it differs greatly from paint.

It is a heavy concentration of metallic zinc in a special binder which permits the zinc in the coating to act as an anode, much the same as the zinc in the hot dip galvanize coat acts as the anode to establish a galvanic cell and thus offers a high degree of cathodic protection.

In this manner, the same type of electro-chemical protection as furnished by the original hot dip galvanize can be used to repair damaged areas in the field without the necessity of heat. Being metallic zinc, the appearance soon is so close to that of the hot applied galvanize coating, that these repaired areas are barely noticeable.

No surface pretreatments are required. Any loose rust or dirt, however, should be removed by any suitable means such as wire brushing or scraping to produce a firm base to which the coating can adhere.

Normally, new galvanizing is not painted until the zinc film has worn or weathered to a point where it has lost its protective value. Many people try to extend this period of time too long and suffer severe consequences.

When new, galvanizing has a comparatively light and bright appearance. After a few months of weather exposure, this dulls down to a neat gray color. Just prior to ultimate failure, generally after many years under normal exposures, the color darkens and in some cases becomes almost black. This is accelerated in industrial areas where the zinc anode (a chemically reactive base metal) of the hot dip or Galvanox coating, is readily attacked.

It is at this stage that paint for maintenance is most practical. By this time, the investment in the initial cost of galvanizing has been recouped by low maintenance attention and still little or no rust is in evidence. This means that no surface preparation prior to paint application is required other than normal wiping to remove surface dust and dirt, or suitable washings to remove chemical deposits if any. Expensive scraping and wire-brushing of rust is eliminated.

Corrugated Sheet

Buildings constructed of corrugated galvanize sheet, however, present still another problem. Due to differences in exposure conditions, the various sections of the building weather at different rates. These differences are due to positioning of the structure with regard to the sun, prevailing winds, nature of adjacent industry, direction of the ocean, etc. The result is that some sections may show rust before another sec-

tion is weathered enough to accept paint.

In such cases it is recommended that the building be given a proprietary cold phosphate etch shortly after construction and that it be painted immediately thereafter. This pre-treatment will roughen the surface sufficiently to insure good initial adhesion. Equally important, by depositing an inert phosphate insulator between the paint film and the zinc coating on the steel, it will minimize the formation of basic zinc salts which are the cause of long term peeling and loss of adhesion over galvanize.

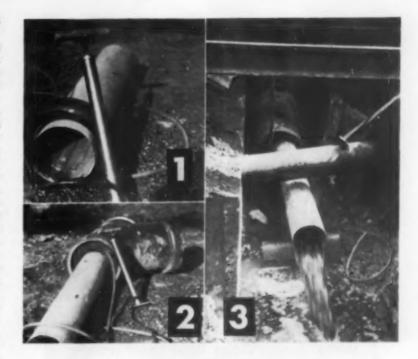
Additional Protection

Whether the building or structure is painted after long weatherering, or whether it is painted when almost new with properly pretreated surfaces, a single coat of a rust-inhibitive, metallic base paint will suffice to protect the still partially existent galvanize coating. In other words, the remaining galvanizing whether hot dip or Galvanox, still furnishes cathodic type protection while the paint film provides an organic, rust-inhibitive barrier between the base metal and the elements.

Paints based on suboxide of lead blended with aluminum offer this protection and do not interfere with the continuance of the electrochemical protection previously established by the galvanic cell. They do not peel and can be used as a single coat without the necessity of other metal primers or finishes. They work equally well over the hot applied zinc coating as well as the cold applied Galvanox film. As they are available in many varieties, the original appearance of galvanizing can be continued, or if a change in color is desired, various shades of grays, greens, blues and tans are available.

Cost Data

The initial cost of galvanizing not only includes the cost of the hot dip zinc film, but also the cost of proper surface preparation, cleaning, pickling and drying. This is particularly important, for every maintenance engineer knows that the cost of cleaning steel after erection is equal to or more than



Hot Joint Poured in Terra Cotta Drain With Water Still Flowing Through Pipe

By J. C. BARNHARDT, Vice President Barnhardt Manufacturing Co. Charlotte, North Carolina

WITH increased emphasis on industrial waste treatment, maintenance of drain pipes has become an important plant problem. We have about a half million gallons of waste—acid, chlorine bleach and caustic—flowing through a 12" terra cotta pipe, which had cracked under vibration of an overhead train track. Our problem was how to pour a hot joint in the terra cotta drain with the waste water still flowing through the pipe.

We had no way to divert the waste water and could not shut it off. After studying the problem, we purchased an inner tube which fit inside a 12" lawn mower tire. Then we located a 7" galvanized pipe in the scrap pile. We then wrapped the inner tube around the 7" pipe (Photo 1), placed the entire assembly in the 12" drain (Photo 2), and inflated the inner tube. We thereby stopped the drain from flowing over the joint to be renewed and dumped the waste water far enough down stream where it did not interfere with pouring the hot joints (Photo 3).

We repeated this operation for each length of pipe. On the last section we used half tile or split pipe, laying the bottom half first. We then took our inner tube out and laid the top half on and completed the hot joint.

the actual cost of paints and painting. It is also difficult to find competent labor today who will perform such cleaning tasks well.

To preserve this investment in well cleaned surfaces means that prompt attention must be given to each little break, and repairs should be made promptly to prevent the cancerous spread of rust and corrosion.

By T. J. EBERHARDT, Vice President, Subes, Inc., Mackensock, N. J.

Ideas . . Methods . . Gadgets (continued)



Dallas, Texas, Water Department Installs Plastic Drain Lines in Purification Plant

Installation of plastic pipe as chemical drain lines has been completed for the Purification Division of the Dallas, Texas Water Department. The plastic pipe is being used to carry purification chemicals such as ferric iron and lime.

The conversion to plastic lines was made after the successful use of Southwestern Plastic Pipe for the transmission of chlorine gas in water solution at the Dallas plant during the past year.

According to Ben L. Grimes, Supervisor of Water Purification Plants, the use of caustic chemicals, even in the lead-lined cast iron pipe previously used at Dallas, had caused a continuing problem of replacement because of corrosion. "Southwestern Kralastic Plastic Pipe should not rust or corrode and the mirror smooth interior wall effectively resist the build-up of scale deposits," Mr. Grimes points out.

"From an economy stand point, the Dallas Department found installation costs far below normal for metal pipe," according to Mr. Grimes. Plastic to plastic solvent welds were made in seconds without the necessity of heavy welding

equipment; and plastic to metal joints were easily handled with a plastic caulking compound. Also light weight plastic eliminates heavy handling equipment and reduces the number of workmen required. Standard metal pipe supports were used for the plastic pipe installation.

Maintenance expense is also minimized in that plastic pipe is completely non-corrosive and requires no pointing or up-keep. Another maintenance feature of the Dallas installation is "Drain Pluga" installed in the plastic lines for easy cleaning and "Flooding."

Four and two inch heavy wall kralastic pipe manufactured by Southwestern Plastic Pipe Company of Mineral Wells, Texas was used throughout the installation.

"Cold Joining" Method Salvages \$40,000 Part

A LARGE gear came loose, shattering the swing gear housing of a 3-yd dragline. A new housing was unobtainable and the cost of a complete dragline

was \$40,000. The cast iron housing was broken into several pieces and a repair seemed impossible. If the housing could not be repaired a shutdown was inevitable until a new dragline could be delivered. This loss of production combined with the \$40,000 cost of the new housing would represent a severe loss to the company and its personnel.

Conventional fusion welding would have meant preheating the casting, and no such facilities were available for so huge a part. It was decided to repair with the Low Heat Input process using an electrode designed for "cold" joining cast iron, manufactured by the Eutectic Welding Alloys Corp., Flushing, N. Y.

Defective and fatigued metal were removed with ChamferTrode, the grooving electrode, and all sections beveled.

Xyron 2-24 was inserted into the holder, the amperage adjusted, and short stringer beads applied with a skip-welding technique. The casting was kept to a comfortable handheat throughout the operation. When one section was in danger of overheating, operations were suspended and deposits were applied to a section as remote from the first as possible. Each pass was peened to expand the deposits and relieve stresses.

When the operation was com-



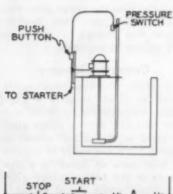
This huge cast iron housing was repaired with Eutectic Welding Alloys' Low Heat Input process.

pleted the casting was examined and checked for distortion. It was found to be well within operational tolerances and deposits were dense, crack free and without a sign of pinholes or porosity.

The dragline was restored to service and for the last two years has been operating at full capacity. Approximately \$40,000 was saved, downtime averted and another piece of "unrepairable" equipment restored to service.

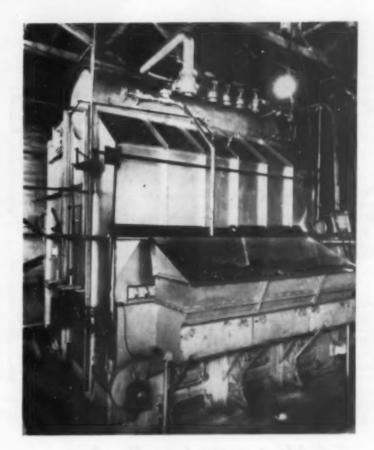
Sump Pump Interlock

THERE are many pump applications where it is desired that they be started manually and left to run until they have completed their operation. In some cases, the pumps may be left to run until the operator returns to stop them after completing their run. In many cases, however, the pump could be damaged if allowed to run dry, such as sump pumps with water lubricated bearings.





A simple circuit, easily installed on a sump pump is shown in the sketches. The pressure switch is installed in the discharge of the pump and connected in series with the starter seal-in contact. This allows the pump to be started without pressure on the discharge of the pump but will not let it seal-in until pressure closes the switch. The elementary wiring diagram is shown. The pressure switch may be set at any value above zero which will allow the switch to open



Flexibility for Steam Plant at the Yates Bleachery Co., Flintstone, Ga.

THIS plant was originally equipped with three 200 hp water tube boilers arranged for hand-firing. Due to increased production and higher steam load, furnace volume was increased by lowering firing floor, and three Fyr-Feeders (manufactured by American Coal Burner and Wood Stoker Corporation, Chicago, Illinois) were applied to the boilers.

A few years later it was found necessary to carry a lower operating pressure on one of the boilers; however, in view of plant production, management decided to remove this boiler and replace it with a large steam generator to carry the load and use the two remaining boilers for stand-by service.

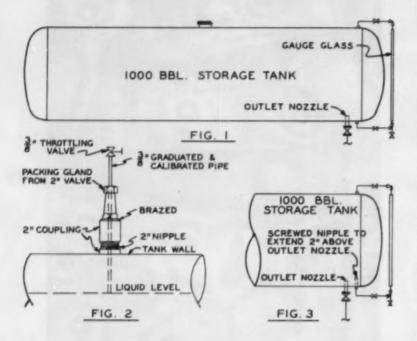
A steam generator with a capacity of 45,000 lb/hr was selected and equipped with a high capacity Fyr-Feeder Multi-Burner Stoker with dumping grates and automatic combustion controls. This equipment provides flexible operation which responds to sudden load change common in plant operation of this kind.

when the pump discharge pressure

The installation is simple, since it can be done by wiring the pressure switch to the pushbutton as shown. This circuit may be used on any pump application where interlocking to stop is desired, while allowing the starting of the motor without interlock.

By R. L. GOUCKENOUR, Lote Cherles,

Ideas . . Methods . . Gadgets (continued)



Method for Improving Gauge Glass Accuracy

IN a Southern refinery considerable difficulty was recently experienced with false level indication of an externally - mounted gauge glass on a 1,000 barrel horizontal tank storing natural gasoline under a positive pressure. The gauge glass, which was installed as shown in Figure 1, suddenly began indicating a level several inches lower than the true liquid level in the tank. Since this tank is used for inventory control the incorrect reading was soon discovered and steps were taken to correct the difficulty.

The correct level was determined by using a slip-tube gauge assembly consisting of a graduated and calibrated tube, one end of which was inserted into the tank through a packing gland as shown in Figure 2. The level was determined by moving the tube up or down and observing whether liquid or vapor flowed from the tube outlet. Using this method it was found that the gauge glass consistently indicated a level two to five inches lower than the true level with the variation depending upon the amount of gasoline in the tank.

\$\$\$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

Southern Power & Industry 806 Peachtree St., N.E. Atlanta 5, Georgia The gauge glass was removed and cleaned, the connecting piping and valves were thoroughly inspected, and the zero point of the gauge glass rechecked, but nothing could be found to account for the false reading.

Trouble Located

This problem was finally solved while blowing down the gauge glass when it was noticed that the gasoline did not seem to evaporate as rapidly as it should. A sample was then taken from the gauge glass and its specific gravity compared with that of a sample taken from the regular tank sampling connection. It was found that the difference in the specific gravities of the two samples exactly accounted for the discrepancy in the liquid level readings.

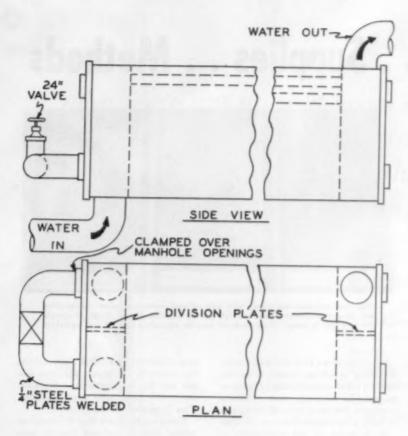
At some time in the past a heavier gasoline or oil had been pumped into the tank and since the suction or outlet connection extended about eight inches above the bottom of the tank this heavier oil remained in the bottom of the tank. The bottom gauge glass connection was flush with the bottom of the tank and thus the gauge glass was always filled with the heavier liquid even though it had been cleaned and blown down.

Corrective Measure

A similar condition could readily occur in other pressure storage tanks, accumulators, or other vessels equipped with a gauge glass mounted in the manner shown in Figure 1. It can easily be avoided in most cases by installing a pipe nipple in the bottom gauge glass connection which should extend a few inches above the suction or outlet nozzle extension as shown in Figure 3.

With this arrangement the possibility of a heavier liquid entering the gauge glass is greatly reduced with a resulting increase in accuracy of liquid level readings. This arrangement is also valuable for reducing the collection of sediment in a gauge glass and for reducing the difficulties with gauge glass freeze-ups during cold weather when water is present with the primary liquid in the vessel.

By GEORGE D. McCLELLAND, Tusca-loosa, Alabama.



Restoring Anodic Film on Condenser Tubes

OPERATORS of condensing equipment are still faced with the problem of tube corrosion resulting in leaking tubes and contamination of the condensate which in most cases is returned for boiler water make-up.

Tube corrosion and tube losses vary considerably in plants where it appears on the surface that the operating conditions, water, etc., are similar. In some cases the tube losses are charged to high velocity of the water through the tubes, and in another obstructions in the tubes, then it may be lack of protective film on the tubes—or numerous other reasons.

Plant designs do not always provide for the flexibility operators desire for by-passing cooling water in condensers, or flow reversal for flushing debris and obstructions from tube sheets and tubes. The need for some such provisions are at times so pressing that operators

and maintenance men resort to improvisations and devices to meet the urgent need.

To meet our conditions and maintain continuity of operation on our 35,000 sq ft condenser, operators and maintenance men devised a welded by-pass connecting the divided water boxes and using a large valve from the salvage yard. (See sketch.)

In this particular case it was reasoned that high velocity of water through the tubes along with the galvanic action removed the protective film from the tubes. This by-pass arrangement allowed for the operation of only one circulating pump on both halves of the divided water box condenser. It also made it possible to frequently inspect each half of the condenser without a shut-down of the complete condenser. With the one circulator in service the machine rating or output was maintained

with only a small loss in efficiency, since the water temperature condition permitted maintaining a good vacuum.

Only a few weeks of operation with one circulating water pump proved to operators that the reduction of water velocity through the tubes was what was needed to aid in the restoration of the protective film on alloy tubes. Studies continue to determine the value of this method of operation by weighing the loss in condenser efficiency against the tube loss and cost of water preparation replacing contaminated boiler water make-up.

By W. P. JARRELL, Toros.

Adjusting Turbine Overspeed Mechanisms

THE overspeed trip mechanisms on many refinery turbines are checked once every three months by a machinist.

Turbine is disconnected from the driven equipment, started, and the speed increased until the overspeed trip is actuated or until the maximum safe speed limit is reached. If the tripping mechanism requires adjustment, it is necessary to remove the governor housing, turn the slotted head adjusting screw which controls the spring loading on the overspeed trip, replace the housing, and again bring the turbine up to the speed necessary to operate the trip.

This trial and error procedure is repeated until the proper adjustment has been made. Occasionally only one trial is sufficient, but more often it is necessary to make several of these time-consuming trials. Each time, the governor housing must be taken off and replaced.

To facilitate the operation, each governor housing has been drilled and tapped for a 1 in. pipe plug immediately above the adjusting screw for the overspeed trip. Adjustment of the trip can now be made by inserting a screwdriver through the 1 in. hole, thereby eliminating the necessity for removing the housing before each trial adjustment.

By OTTO P. PURFURST, Machinist Baytown Refinery, Humble Oil & Refining Company, Baytown, Texas.

Equipment . . Supplies . . Methods

Silicone Rubber Insulation for Motors & Generators

ALLIS-CHALMERS MFG. Co., Milwaukee 1, Wis., has announced the first all-silicone-rubber insulating system for large motors and generators. Known as the "Silco-Flex" system, it is immediately available for all Class H insulated form wound coils and for Class A and B windings operating under certain service conditions.

Using as its basic material Dow-Corning's "Silastic" silicone rubber, Silco-Flex insulation makes available the outstanding advantages known to be inherent in silicone base insulations.

In the manufacture of Silco-Flex insulated stator coils, silicone rubber is applied to conductors, and vulcanized into a homogeneous mass by the application of carefully controlled heat and pressure. The result is a sealed, impervious dielectric barrier, continuous around the coil and leads, which forms a flexible, moisture and heat-resistant wall over the entire coil structure. This is in contrast to conventional high temperature insulating systems built up of various combinations of mica, glass and binders.

The new insulating system offers these advantages in performance:

HEAT RESISTANCE: The excellent dielectric and mechanical properties of silicone rubber do not change significantly with aging at high temperature over long periods of time, even up to 250 C.

MOISTURE RESISTANCE: Completely sealed Silco-Flex insulated coils are the most moisture-resistant commercial coils ever produced.

ABRASION RESISTANCE: Coils insulated with silicone rubber resist abrasive dusts far better than other conventionally insulated coils.

FLEXIBILITY AND RESILIENCE: Flexible and resilient Silco-Flex insulation is especially capable of withstanding mechanical abuse, and the stresses brought about by overloading and rapid starting or stopping of the equipment.

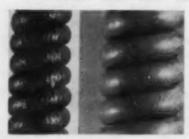
CHEMICAL INERTNESS: Silco-Flex insulation has outstanding resistance to most atmospheric contaminants, corona and weathering. It also withstands weak acids, alkalies, and lubricating oils.



Silco-Flex Insulation compared with conventional insulations after sandblasting with 90-grit aluminum oxide and 100 psi air for one minute. Nozzle-to-sample distance was six inches. Thickness in all samples equivalent to 2300 volt insulation.

IMPROVED HEAT DISSIPATION: Cooler operating windings result from the high thermal conductivity of silicone rubber. In contrast, most electrical insulators are good thermal insulators as well, and impede the flow of heat.

As a result of the availability of silicone rubber insulation, motor application practice is expected to change in a number of industries. In



CORONA RESISTANCE of the new all-silicone-rubber insulation system also contributes to longer life and greater reliability. Relative resistance was determined on samples of extruded cable wrapped around insulated mandrels of the same diameter as the outside diameter of the cable. A copper screen electrode was then wrapped around the cable coils and a stress of 200 volts per mil was applied between the copper wire and the screen. The organic rubber insulated cable (left) failed in 3 minutes compared with 12,000 hours for the Silastic insulated cable (right).

power plant induced draft fan motors, for example, the highly abrasive cinder and fly ash contaminated atmosphere will have little effect on Silco-Flex insulated windings.

Some applications that formerly required totally enclosed frames may now be handled with semi-protected or open type frames. This same trend away from the extensive use of totally enclosed frames may be expected in many applications in the chemical, paper, food, and other industries where the moisture-impervious and corrosion-resisting qualities of Silco-Flex insulation can be exploited.

Motors in cement, crushing and similar industries will retain overload capabilities even where ventilation has been inadvertently reduced by heavy accumulation of dusts in the ventilating passages.

Large machines in the 2300 and 4000-volt insulation class, wound with Silco-Flex insulation, are being built. Higher voltage windings will be available soon. The insulation will be priced on the same basis as previous Class H insulations. Engineers expect that as new production techniques can be worked out, the advantages of silicone rubber can be applied to an even wider range of motor types and ratings.

FOR FREE INFORMATION—Circle code number on pages 16 & 17

why here are no cold spots and less corrosion in the Ljungstrom® Air Preheater

In the Ljungstrom, the heat-transfer surface rotates alternately through the gas and the air streams . . . keeping heating elements consistently hotter than other types in equivalent service. That's why there are no cold spots . . . and less corrosion in the Ljungstrom.

Even though corrosive action is slow, some does take place at the cold end of the Ljungstrom. This presents no problem, since the cold end is sectionalized to permit easy reversal and almost double life. Reversing or replacing the cold end does not disturb the rest of the elements and takes just a few hours.

Get all the details on the Ljungstrom Air Preheater. Send for the new, free, 38-page reference manual, "Ljungstrom Air Preheaters."

Advantages of the Ljungstrom Air Preheator

- Size for size, recovers more heat than any other type.
- Reduces fuel consumption. Permits use of lower-grade fuels. Increases boiler output and reliability.
- Eliminates celd spets . . . keeps correction to a minimum.
- * Easier, faster to clean and maintain.
- Requires far less supporting steel and is quickly erected.

DEW POINT

The Air Preheater Corporation 60 East 42nd Street, New York 17, N. Y.

Equipment . . Supplies . . Methods (Continued)

Piping Connection

GRAY TOOL COMPANY, Box
2291, Houston 1, Texas, is
marketing the "Graloe" connection which offers industry a "one
specification" connection for all piping applications and pressure ratings.

Connection requires no selection of gaskets, facings or bolts, all parts being fully interchangeable and reusable. The connection employs a twobolt clamping principle and a stored energy seal.

A steel sealing ring, having flexible lips and a rigid rib fits between the steel connecting hubs. The angle of the tapered lips of the ring is less than the tapered seats of the hubs. As the joint is made up, the lips of the seal ring conform to the seats of the hubs. Internal line pressure serves to increase the effectiveness of the seal without creep or movement.

The rib of the seal ring affords rigidity, necessary both in handling and in preventing excessive crushing or misalignment during use, without



Gray Tool Company's "Graloc" Connec-

sacrificing full bore or minimum pressure area of the connection.

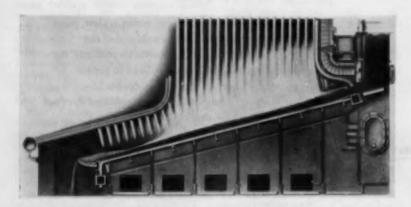
Instead of the usual bolting, "Graloc" uses a two-piece steel clamp which works against tapered shoulders on the connecting hubs. The clamp is held in place by two highstrength steel bolt studs. Bolting can be handled from the top, bottom or side, and the entire connection can be assembled quickly with no necessity for periodic re-tightening. Internal pressure of the line does not affect the bolting load, and over-tightening will not harm the connection.

The connection will far exceed the pressure limits and bending momenta in the heaviest wall pipe. Because it is of all steel construction, expansion or contraction does not affect the seal. It is leakproof when used with any fluid at any temperature the pipe is capable of carrying, including light hydrocarbons, steam and even low molecular weight gases.

In an independent laboratory, a 7 1/16" bore connection was subjected to a dry nitrogen gas test, fluctuating up to 19,500 psi and temperatures up to 172 F without leaking.

Standard "Grayloc" connections are made in three styles: butt welding, slip-on and threaded, in a range of sizes from 1½" to 12" for all standard weights from schedule 40 through schedule 160 or XX strong. They can be made for super pressure applications and of heat and corrosion resistant material.

For more data circle item code number on the postage free post cord - P. 17



Water-Cooled Stoker Abolishes Stack Nuisance

G-3 COMPANY, Aramingo Ave. and Cumberland St., Philadelphia 25, Pa., announce the new water-cooled AE Vibra-Grate Stoker designed to abolish stack nuisance and burn the most economical coals with top efficiency.

The stoker has its vibrating blockcovered water wall connected right into the boiler circulation, and provides freedom from smoke, even at low ratings, elimination of dust collectors, and adaptability for burning gas or oil in combination with coal, or singly.

Fuel is moved by an intermittent vibrating motion imparted to the grate through a floating eccentric. The vibrating action levels and autocompacts the entire fuel bed, leaves no holes or light or heavy spots, and discharges ash simultaneously and autocharges ash simultaneously and automatically. The vibrating grate section forms the bottom of the coal hopper and insures constant coal feed regardless of moisture content.

The stokers are available in standard capacity ranges from 25,000 to 100,000 lb of steam per hour, with smaller and larger sizes available for special conditions.

All-Angle Drill

PLOMB TOOL COMPANY, Box
3516 Terminal Annex, Los
Angeles, Calif., announces
design of a PROTO all-angle drill
with both the chuck and handle adjustable to various angles, to reach
around obstructions, work close to
floors and walls, and operate in close
quarters.



The 0" to ¼" capacity chuck swings in a 270-degree arc, and has a spring lock that enables the user to change angles with a flip of the thumb. The handle turns in a 180-degree arc at right angles to the chuck movement path. It is held in its several positions by an adjusting screw. Storage space is provided in the hollow handle for a large number of regular and high-speed drills.



A COMPLETE YARWAY SYSTEM

Besides Remote Liquid Level Indicators, Yarway also offers Liquid Level Recorders and Remote Signal Alarms ... making a complete system for constant, accurate liquid level check.



Yarway Hi-Lo-Graph Recorder provides not only water level indication, but also a 24-hour recording of water levels. See Yarway Bulletin WG-1830.





Yarway Remote Hi-Lo-Alarm Signals-lights or horns-can be placed at any location in plant. See Yarway Bulletin WG-1824.

new WIDER VISION

for easier remote boiler water level readings

■ Vastly improved visibility of remote boiler water level readings can now be enjoyed by boiler plant operators.

A new "wide vision" face on Yarway Remote Liquid Level Indicators allows reading from the side as well as front of the indicator. Boiler water levels and other liquid levels can be checked from most any position.

Indicating mechanism is operated by the boiler water level itself-assuring instant, accurate readings.

Yarway Indicators are of the manometric type with automatic temperature compensation, as approved for use under the recent A.S.M.E. Boiler Code Committee ruling in Case # 1155.

Over 10,000 are used throughout industry for boiler water and other liquid level indication . . . and for superheater pressure differential indication aboard ship.

For full information write for Bulletin WG-1824.

YARNALL-WARING COMPANY

Home Office: 116 Mermaid Avenue, Philadelphia 18, Pa. Southern Representation: BOOKE A. MARTIN, BODG Allen Building, Atlanta 3, Go.

remote liquid level indicators



Concrete Type Surface Flooring Material

NAUGATUCK CHEMICAL DIVISION, UNITED STATES RUBBER Co., Rockefeller Center, New York 20, N. Y., has developed a new concrete-type industrial flooring and construction material that "gives" without cracking under heavy loads, dampens shock and noise, resists alkalies and mild acids, is waterproof and has a non-slip quality.

The material is a combination of

liquid rubber and a special cement powder, and is called "Laticrete." The rubber content makes it so flexible when hard that a long, thin slab can be bent into a circle by hand. The rubber also gives the cured mix "bounce" and a tight bond that makes it resist breakdown under heavy use.

The concrete-rubber mix is a surface coating and can be used for repair work or in new installations. It has good adhesion to concrete, metal and even glass. A quarter-inch layer, the suggested thickness, will support heavy loads such as fork lift trucks

when put down over a hard base.

Laticrete comes in two parts—the powder and a liquid rubber—and is prepared like regular concrete. Standard masonry equipment is used both to mix and apply it. One of the few requirements in using it, is that it must be applied to a clean surface. Otherwise it is handled like concrete or mortar and can be trowelled or buffed to give a smooth surface.

The Bulletin Board for Southern Industry

Southern & Southwestern manufacturers offer free literature on their latest developments in equipment and supplies.

See pages 92 & 93

Steam-Hot Water Generator

G-7

CYCLOTHERM DIVISION U. S.

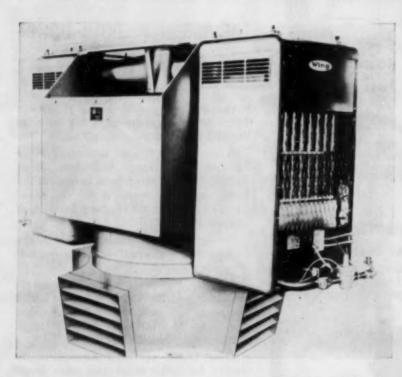
RADIATOR CORPORATION, Oswego 1, N. Y., has introduced a new boiler which is basically a hot-water generator, but simple adjustments convert it to steam operation in a few seconds.

Both the steam and hot-water phases operate completely automatically once the proper type of operation is selected. The new combination steam-hot-water generator is expected to find wide use in plants that are heated by hot water, but an occasional use for steam (such as steaming out tanks, de-greasing and limited processing) is required.

The new unit operates on light oil, gas or a combination of light oil and gas. It is rated as a 60 hp steam or hot water generator.

As a hot water generator, it generates 2,010,000 Btu per hour. Working pressure is 30 psi. It will deliver 2,480 gallons of hot water per hour with a 100 deg rise in temperature.

As a 60 hp steam generator, the unit delivers 2,070 pounds of steam per hour. Operating pressures ranging from 15 to 200 psi can be manufactured as standard equipment. On change-over from hot water, the unit will deliver steam in five to ten minutes.



Gas-Fired Unit Heater

G-6

Linden, N. J., has introduced a new ceiling suspended, downward discharge heating unit, combining gas burners, combustion chamber and heat exchanger with motor driven fan and fixed or revolving discharge outlets.

The combustion chamber and heat exchanger are constructed of 16 gauge aluminized steel, welded into a one-piece, rugged, gas-tight assembly. Burners are heavy wall cast iron with accurately drilled ports. A built-in draft diverter insures proper burner operation under abnormal conditions

of back draft. Automatic safety controls are provided. The first size in the new line has an input capacity of 430,000 Btu/hr. Other sizes will be added in the future.

These gas-fired unit heaters are equipped with discharge outlets to suit the installation requirements of ceiling height and floor area. The revolving discharge outlets send the heat downward in a gently moving air-stream that covers the entire working area. The worker feels no steady blast of hot air but only a momentary breath of warm air. The same circular motion of air provides cooling in the summer.



FISHER WIZARD - - - UNIVERSALLY ACCEPTED AS THE

FISHER GOVERNOR COMPANY . Marshalltown, Iowa

WORLD LEADER IN RESEARCH FOR SETTER PRESSURE AND LIQUID LEVEL CONTROL

Equipment . . Supplies . . Methods (Continued)

Vent-Drain-Bleeder Valve

GRAY TOOL COMPANY, P. O. Box 2291, Houston, Texas, is offering the new stainless steel "GRALOC" vent-drain-bleeder valve, selling for \$2.95 and \$3.45 in sizes 1/8" and 3/4" respectively, and designed for 20,000 psi safe working pressure or temperatures up to 1200 F.



Gray Tool Company's low cost stainless stool vent-drain-bleeder valve.

A pressure-aided seat makes it leakproof for oil, water, gas or steam service. It is fabricated from a combination of types 410 and 416 stainless steel, making it suitable for essentially any fluid or atmosphere, and providing a maximum resistance to galling.

It may be used for vents and drains at the high and low points of piping, equipment and instruments, to bleed at double block valves, and as freeze drains, trycocks and sample connections.

Two Bolt Flange Bearing Unit

G-9
Co., Sealmaster Division,
Aurora, Ill., is marketing a
two bolt flange ball bearing unit,
which is interchangeable with the
Sealmaster four bolt flange units on



the diagonal bolt hole dimension, and is available in shaft sizes from ½ to 2-3/16 inches.

The two bolt flange unit retains all of the Sealmaster patented design features such as Zone Hardening, self alignment with locking pin and dimple and labyrinth seal.

On new installations it eliminates two fasteners as well as the punching or drilling operation for two mounting holes. In addition, it cuts installation costs and allows for closer bearing spacing on multiple shaft installations.

As a replacement bearing, the new unit fits the diagonal bolt centers on present four bolt base flange units and carries the same load rating for a given shaft size.

5-Power Magnifier

S. B. LOGAN & COMPANY,
P. O. Box 498, Genoa City,
Wis., announces a new, valuable tool called "Precision-Vision 5Power Magnifier," which represents
high achievement in accuracy, nondistortion and all-around utility.



Built to withstand rough usage, the magnifier consists of: (A) all aluminum frame, 2" in diameter, %" in thickness, in a black crinkle finish to eliminate reflections; and (B) two individual optical-ground, polished, 1%" lenses, press-locked into mountings, so as to maintain them absolutely dust-proof and breakage-resistant. The two lenses are separated by air space, precision set to bring about clear magnification.

Attention is called to the non-distortion advantages of this magnifier, and to the scientific designing which assures high correction for spherical aberration. This is of greatest importance where accuracy is vital.

"Precision-Vision" is light in

weight and easily carried in a pocket. Suitable for use in industry, arts, professions, trades, hobbies and crafts. The price is only \$3.50 postpaid, individually boxed. Descriptive literature sent upon request.

Pneumatic Sponge Pump

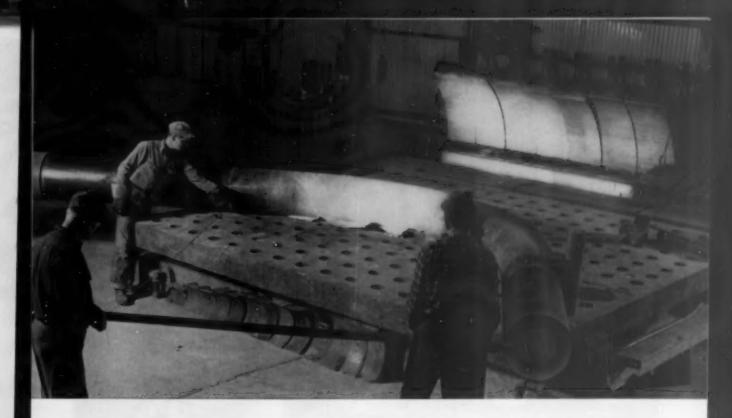
Byron Jackson Co., Pump Division, P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif., announces a heavy duty, rugged, yet compact and light-weight Pneumatic Sponge Pump that is ready to go to work by simply connecting it to a 105 or 125 cfm air compressor.



The pump has wide application for use in mine shafts, coffer-dams, caissons, sumps, cisterns, pits, tanks, basements, manholes and bilges; on construction projects, for salvage work or other applications involving the pumping of water and other fluids containing sand and abrasives.

It is a vertical, single stage, centrifugal pump driven by a rotary air motor built to operate on compressed air at pressures ranging from 60 to 100 psi and air consumption from 57 to 99 cfm. This high-lift sump pump was developed to operate against heads of 7 to 76 cu ft and capacities up to 380 gpm.

The rotary air motor is equipped with a governor and has a variable speed control, thereby permitting regulation to suit particular conditions of the job. An oiler is attached with ample capacity for ten hours operation. This oiler may be detached and used anywhere in the air supply line.





This station, having an initial capability of 276,000 km, was designed and erection supervised by Gilbert Associates, Inc., Reading, Pennsylvania. It is one of the most efficient and low-cost stations in the country.

At the new Shawville Station of Pennsylvania Electric Co. it's NAVCO Piping throughout

Over 37 miles of pipe were installed by Navco in this highly efficient reheat station and all necessary prefabricated assemblies, in excess of 2,000,000 lbs., were produced in Navco shops. For field welding only, more than 15 tons of electrodes were used.

The photo above shows one of the bends required for the Main Steam. It is 16" O.D. forged and bored with a wall thickness of 3.084" and weighs 5½ tons. Material is ASTM A-335 P-22—2½% Chrome. Operating conditions are 1850 psi at 1050°F. ini-

tial, with 1000°F. reheat.

The photo at the left shows this bend in service supported by dependable Navco Counterpoise Hangers.

In the past three years alone, Navco Piping has been installed in Central Stations generating in excess of 4,000,000 kw.

Next time you have a Piping job requiring reliability in performance and careful attention to every small detail, Navco will welcome the opportunity of quoting you.

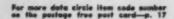
Call, wire or write today!



NATIONAL VALVE & MANUFACTURING COMPANY

3106 LIBERTY AVENUE, PITTSBURGH I, PENNSYLVANIA

New York . Chicago . Cleveland . Boston . Atlanta . Buffalo . Cincinnati





Your plant and equipment suffers . . . your community goodwill fades away. These problems can be solved. Prat-Daniel Collectors are designed for the control of industrial dusts and flyash. Multiple small diameter tubes provide powerful centrifugal forces, resulting in sustained high collection efficiency . . . even with ultra-fine dusts.

Whether the problem is industrial dust or flyash, you are assured of satisfaction with P-D Collector Systems, engineered to meet your specific needs.

Write for Reprint No. 102 titled, "What Type Collector?"





Project Engineers
THE THERMIX CORPORATION
GREENWICH, CONN.

(Offices in 38 Principal Cities)
Canadian Affiliates: T. C. CHOWN, LTD., Mantreal 25, Qua., Toranto 8, Ont.

Designers and Manufacturars

PRAT-DANIEL CORPORATION

POWER DIVISION: Tubular Bust Collectors, Forced Draft Fans, Air Preheaters, Induced Draft Fans, Fan Stacks

Aluminum Roof Coating

G-12 INC., 10703 Quebec Ave., Cleveland 6, Ohio, is offering "Siliconed Asbestolite," a new bright aluminum coating, developed to protect and preserve roofs while reducing under-roof temperatures as much as 20 degrees.



The new coating is basically composed of top quality asphalt, long strand Canadian asbestos and water-proofing oils. To these have been added silicones and billions of pure extra bright metallic aluminum flakes. The latter reflect the sun's rays and turn back approximately 71% of the sun's heat.

Siliconed Asbestolite is adapted for use on roofs of air conditioned buildings, refrigeration plants, etc. It reduces the cooling job of air conditioning equipment and is reputed to effect substantial savings on the amount of electric current or ice required.

The product is also used to shield buildings against cold. By holding roof temperatures more nearly constant with those of building interiors, it is claimed to reduce condensation by 60 to 70%. Consequently, it is well suited for application over concrete block walls.

Asbestolite comes ready mixed and ready to use in 5-gallon cans and 30 and 55-gallon drums. It does not require heating or thinning and can be sprayed on or applied with a roofing brush or squeegee. It is suitable for use on all types of roofs and can be applied over old coating without bleeding. It is not affected by roof expansion and contraction and does not erack or blister.

News (continued)

(Starts page 10)

FUTURE EVENTS Of Engineering Interest

SOUTHEASTERN ELECTRIC EXCHANGE,

J. W. Talley, Mg. Dir., 203 Haas-Howell Bidg., Atlanta 3, Ga. Aug. 11-12, Personnel Administration Sec-tion, Roanoke Hotel, Roanoke, Va. Sept. 23-33, Engineering & Operating Sec-tion, Charlotte Hotel, Charlotte, N. C. Oct. 27-28, Sales Conference, Biltmore Hotel. Atlanta, Ga.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, H. M. Stewart, Chm. of Conference, P. O. Box 2827, Baytown.

Sept. 12-14, Electrical Conference of the Petroleum Industry, Shamrock Hotel, Houston, Texas.

PUBLIC UTILITIES ASSOCIATION OF THE VIRGINIAS, Robert W. McKinnon, THE VIRGINIAS, Robert W. McKinnon, Exec. Sec'y, 5 Franklin Road, Roanoke,

Sept. 15-18, 27th Annual Meeting, Green-brier Hatel, White Sulphur Springs,

AMERICAN SOCIETY OF LUBRICATION ENGINEERS and AMERICAN SOCIETY OF MECHANICAL ENGINEERS, La-brication Activity Group, E. M. Phillips, Sec'y, 5 Westminster Road, Marbichead,

Mass. ct. 10-12, Second Lubrication Confer-ence, Antiers Hotel, Indianapolis, Ind.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, E. K. Slevens, Mgr. In-ternational Exposition Co., 489 Lexing-ton Ave., New York 17, N. T. ov. 14-18, Chicago Exposition of Power & Mechanical Engineering, Chicago Coli-

eum, Chicago,

25TH EXPOSITION OF CHEMICAL INDUS-TRIES, E. K. Stevens, Mgr., Interna-tional Exposition Co., 480 Lexington Ave., New York 17, N. T.

Dec. 5-9, Exposition, Commercial Museum and Convention Hall, Philadelphia, Pa

Unarco Addition-Texas

UNION ASBESTOS & RUBBER COM-PANY is completing a 50,000 sq ft steel and concrete addition at its new TYLER, TEXAS, plant, which will double the size of the existing plant.

Unarco moved to Tyler from Mc-Gregor, Texas, last fall and began the production of Unibestos Amosite pipe insulation in January. E. T. Johnson is vice president in charge of operations.

Wheeling Steel Promotes Burkland to Ch. Ind. Engr.

CARL D. BURKLAND has been promoted to the position of chief industrial engineer by WHEELING STEEL CORPORATION, WHEELING, W. VA.

Burkland joined Wheeling Steel in 1946 as a production engineer at the Yorkville, Ohio, Works. He is a graduate of Miami University of Ohio.



- with hand tools on the job or in the shop?

Porter hand power cutters cut up to and including

34" bolts — hard or soft 34" chain 55" rod 34" wire rope

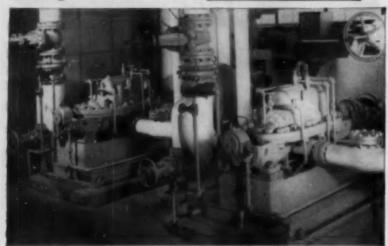
as well as steel strapping, insulated cable, spring wire, etc.

SEND for this book which shows

materials to be cut and cost comthe EAST WAY parisons between cutting methods. It may save you money. H. K. PORTER, INC. Somerville 43, Mass. Please send me my copy of "CUTTING METALS THE EASY WAY". NAME COMPANY STREET CITY STATE MY DISTRIBUTOR IS

PRODUCTIONS

Begins in the Boiler Plant



Warren Six Stage Boiler Feed Pumps installed at a Southern Board and Paper Mill.

Boiler Feed Pumps may look much alike, type for type, but it is well to keep in mind such intangible factors as:

- Experience and integrity of the manufacturer
- · Dependability of product
- Know-how, Workmanship, Service
- Maintenance and Repairs
- Lost production due to down-time
- Early replacement because of "tight" original recommendations

It is impossible, of course, to get these items into your "specs," or the supplier into his "quotes," but don't overlook their importance with relation to price, possible future requirements and production continuity.

Get your share of "intangibles" . . . specify



WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC.

News (continued)

Tidewater Supply Represents American Flexible Coupling

R. S. PASCHAL, SR., with offices at 807-811 Gervais St., COLUMBIA, S. C., operating as the TIDEWATER SUPPLY COMPANY, has been appointed sales representative for the flexible couplings and allied power transmission products made by AMERICAN FLEXIBLE COUPLING COMPANY and nationally marketed by Amerigear-Zurn, Inc., Erie, Pa.

Assisting Mr. Paschal are engineering sales representatives who will cover a territory that includes the state of South Carolina: John E. Panne, who will call on industries, utilities and mills in the vicinity of Greenville, S. C.; and R. S. Paschal, Jr., who will work out of the Columbia office.

Wheelco Instruments, Atlanta

WHEELCO INSTRUMENTS DIVISION, BARBER-COLMAN COMPANY, announces that D. COMBELLACK, formerly associated with the Detroit Wheelco office, is now located at the ATLANTA, GEORGIA, office.

Tolliver Heads Tube Turns Sales Development Division

JACK D. TOLLIVER has been appointed manager of the recently established Sales Development Division of TURE TURNS, LOUISVILLE, KY., a division of the National Cylinder Gas Company, Chicago.

The primary functions of the division will be to develop new applications for Tube-Tubn products, to assist in the broadening of existing markets, and to coordinate industry-wide promotional programs.

Tube Turns' Sales Development Division succeeds the company's Engineering Service Division, formed in 1945, and will be staffed with the same personnel.

Winder Aircraft Expansion

WINDER AIRCRAFT CORPORATION of WINDSOR, GEORGIA, will build a new plant in the Southeast to manufacture electronic equipment. Present planning calls for a very modern type of structure of approximately 25,000 sq ft, with air conditioned engineering and administrative offices.

The Electronics Division of the Winder Aircraft Corporation is currently manufacturing electronic products for the U. S. Government as well as for commercial users in this country and abroad.

Much of the new manufacturing capacity will be used in producing a new type of navigation equipment. The actual building site has not been determined but surveys are currently being undertaken and building plans are being processed.

Winstead Appointed Kidde Southeastern Dist. Mgr.

WILLIAM K. WINSTEAD has been appointed Southeastern District Manager of Walter Kidde & Company, Inc., Belleville, N. J. His territory covers eleven states with headquarters at 101 Marietta Street, N. W., Atlanta, Georgia.

Mr. Winstead has had wide sales experience in the South. He was formerly Southern sales representative for L. Sonneborn Sons, Inc.

Wayne Pump Co. Expands-Md.

THE WAYNE PUMP COMPANY has announced its latest plans to expand its plant in Salisbury, Maryland. The new plant addition will include new and improved machinery and equipment.

Plans call for a building addition containing nearly 3 acres of floor space. The facilities are expected to cost about \$1 million and be ready for occupancy about November, 1955. This addition will approximately double the manufacturing space at the College Avenue location of the Salisbury, Maryland plant and it will integrate the Salisbury operations.

The new system for finishing and painting includes continuous spraytype bonderizing. It will also utilize a new pressurized air control system in the paint shop to prevent the accumulation of dust on freshly painted pumps and parts. Other improvements include new modern ovens for baking enamels to uniform higher quality finish. Wayne loading and unloading docks will be installed in the new warehouse and shipping sections for the purpose of increasing safety and protection of employees, and to speed the handling of material and finished products.

WEST COAST VETERANS' HOSPITAL



USES WING PACKAGED POWER PLANT DRAFT INDUCER



The reasons for the selection of WING Draft Inducers for this and other important power plants are these:



wing POWER PLANT DRAFT INDUCER Turbine or Motor-Drive available. Fan and bearing assembly may be withdrawn from housing for inspection and servicing. Big Savings in Space No Water Cooling of Bearings

No Lubrication Neededbearings are sealed

Interchangeable Inletstop, bottom or sides

Easy to Inspect and Maintain

High Fan Efficiency

Get the complete story. Write for bulletin. Use the coupon.

L. J. Wing Mfg. Co. 160 Vreeland Mills Road, Linden, N.J.

Wing

L. J. Wing Hig. Co., Lindon, N. J. Please cend me Bulletin I-95—Draft Inducers	SP1-7
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City	







Darts Won't Leak NOW or LATER!



This True Ball Joint Makes the Difference

You expect a new union to give service. But what of next week, next month, next year? You can count on each Dart you install today to be leakproof. Yes and even after you use 'em over and over (they go on and off easily) they'll still give you a drop-tight seal because the seats are built to remain unscarred. Figure what you save in time and money with this type of equipment!

QUICK FACTS

- Leakproof because precisionmachined to a true ball joint and spherically ground
- Nut and body practically indestructible. They're air refined, high test malleable iron.
- Extra wide seats of bronze alloy resist pitting and corrosion
- Heavy shoulders take severe wrenching in stride



• ALSO — EACH DART
IS INDIVIDUALLY
VACUUM-TESTED —
ABSOLUTELY TIGHT
WHEN IT LEAVES
THE FACTORY

UNIONS

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The Fairbanks Company, General Distributing Agents:
Boston · New York · Pittsburgh · Rome, Georgia

News (continued)

Safety Awards for Unarco

Two national safety awards and one state safety award were presented to the Union Asbestos & Rubber Company's Marshville, North Carolina, plant recently.

The 1954 Certificate of Safety Achievement from the United States Department of Labor and the North Carolina Department of Labor were presented to ROBERT LANE, Unarco plant manager in Marshville.

In addition, Lane was given a Certificate of Commendation on behalf of the National Safety Council. The awards were won for the plant's outstanding safety record in operating more than a year without a single lost-time accident.

Gilder is Ch. Metallurgist for Reed Roller Bit—Tex.

WILLIAM D. GILDER recently became associated with the REED ROLLER BIT COMPANY OF HOUSTON, TEXAS as chief metallurgist.

Mr. Gilder has had 24 years of metallurgical experience. He was last associated with the Weatherhead Company of Cleveland as chief metallurgist.

He received his B.S. Degree from Notre Dame, and his Master's Degree in Metallurgy from Carnegie Technological Institute. He has been active for many years in the American Society for Metals, the Cleveland Engineers Society, and the Compressed Gas Association.

Harvey Aluminum-Dallas

The Dallas field engineering office of HARVEY ALUMINUM has been moved to 3918 Harry Hines Blvd., according to ART BAUER, district sales engineer in charge of the Texas area.

Textile Paper Products to Build Southeastern Plant

G. H. EDWARDS, president of TEXTILE PAPER PRODUCTS, INC., CEDARTOWN, GEORGIA, and CROSSETT, ARKANSAS, has announced plans to locate another plant in the Southeast, so that the company can further improve the service now being rendered the Textile Mills and Paper Mills of the area.

The plant will manufacture a complete line of Spiral wound and Convolute Tubes and Cores as well as specialty items.

The exact location has not yet been determined but it is expected to be somewhere in the Greensboro, Winston-Salem area. Operations are expected to begin in the early Fall of 1955.

Newsprint Mill-Mobile

THE INTERNATIONAL PAPER Co. has announced plans for a new \$20,000,000 newsprint mill to be built in Mobile,

According to Erling Riis, company vice president and general manager of the Southern Kraft Division, the mill will be located adjacent to the International paper and bag mill at nearby Plateau, north of Mobile.

The mill will have an annual capacity of 100,000 tons of newsprint, and require 365 cords of pulpwood and six million gallons of water daily.

Operation is scheduled to begin about August, 1956, and 425 persons are to be employed.

George Simonds Company is Florida Agent for Eric City

ERIE CITY IRON WORKS, Erie Pennsylvania, has announced the appointment of GEORGE L. SIMONDS COMPANY, WINTER HAVEN, FLORIDA, as District Sales Agents for the State of Florida.

George L. Simonds Company was founded in 1933 by the late George L. Simonds. In 1946 the Company was incorporated, at which time they engaged in the sale and application of plastic refractory for boiler settings, incinerators and general furnace construction. Since that time, by progressing with Florida industry, they have expanded their sales and service organization to include industrial insulation work, all types of refractory installations and complete boiler settings.

George L. Simonds Company also operates a District Office at Pensacola, Florida, managed by R. A. McMillan, who was formerly sales engineer for the Plibrico Company, Chicago, Illinois.

With the representation of Eric City Iron Works, George L. Simonds Company is equipped to furnish all equipment, material and skilled labor for the installation of complete steam generator plants.

Expect 5 to 8 YEARS protection

for galvanized towers from a

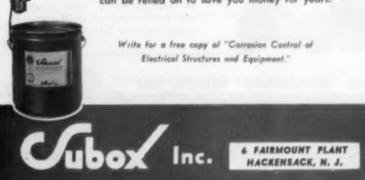
SINGLE COAT OF SUBOX



galvanizing than active suboxide of lead—the basic pigment in Subox and Subalox paints.

There's no surer way to get economical and effective preservation of galvanized structures than by coating them with Subox or Subalox. In most instances, a single coat is sufficient and Subox or Subalox—will not chip, crack or blister during years of exposure to the elements.

What's more, repainting is simpler and more economical when these paints are used. They cost no more than any good paints, and can be relied on to save you money for years.





EVERLASTING DUPLEX UNITS

also available with Y Valves and in any combination of Quick-Operating, Angle and Y Valves.

FOR "everlasting" service, use

EVERLASTING

EVERLASTING VALVE CO.

S3 FISK STREET, JERSEY CITY S, N. J.

News (continued)

Clark Bros. Co. Opens New Atlanta Office

CLARK BROS. Co., Olean, N. Y., manufacturers of engines and compressors, announce the opening of a new office at 685 West Peachtree St., N. E., ATLANTA, GEORGIA.

RICHARD FOSTER, who heads the new office as Atlanta district manager, is a graduate of Georgia Institute of Technology, and has had extensive experience in the heavy machinery field.

New Construction for Vepco

VIRGINIA ELECTRIC AND POWER COMPANY will spend over \$53,000,000 on new construction this year, according to Vepco president Jack G. Holtzclaw.

Included in the 1955 construction budget is \$11,700,000 additional for the hydro development being built on the Roanoke River at ROANOKE RAPDS, N. C. and \$7,300,000 for the completion of a third generating unit at the Possum Point power station near QUANTICO, VA.

Improvements to the present electric and gas properties and the extension of electric and gas services to new customers will cost almost \$23,000,000; and \$3,800,000 is to be expended for changes in the company's high voltage transmission network.

Appropriations for the Richmond-Petersburg area will include a storage, repair, and maintenance shop in Richmond; a dust collector installation at the Chesterfield Power station; a distribution service building in Petersburg.

In the Hampton Roads area expenditures will include \$2,500,000 for completion of the addition to the Portsmouth power station. In Norfolk, Newport News, and Hampton, where the company supplies natural gas, improvements and expansion of the gas system will cost approximately \$2,600,000.

D. B. Gooch, Birmingham, Moves to New Quarters

D. B. GOOCH Of D. B. GOOCH AS-SOCIATES, INC., announces that the company has moved to new and larger quarters at 5018 First Avenue North, BIRMINGHAM 6, ALABAMA, from its old address on First Avenue.

for descriptive bulletin.

Kerrigan Promotions-Tenn.

Philip Kerrigan, Jr., president of Kerrigan Iron Works, Inc., Nash-ville, Tennessee, recently announced the promotion of R. F. Jennings from plant superintendent to director of safety and personnel.

Mr. Jennings, who studied industrial relations and leadership at Purdue University, started his career at Carnegie Illinois Steel. He came to Kerrigan in 1948.

Other recent assignments at Kerrigan include STEPHEN KRIST as superintendent of the North Side Plant; DEAN C. OSTRANDER as superintendent of the River Plant; and BEN H. JUHAN as manager of the Grating Division. These changes are in line with the company's expansion of personnel and production facilities in the manufacture of grating in all metals, sizes and types.

Reynolds Metals-Va. & Ky.

REYNOLDS METALS COMPANY, 2500 S. Third St., LOUISVILLE, KENTUCKY, announces that C. DAVIS BLACKWELDER, a vice president of the company, has been appointed consulting engineer for the operations division. He will have his office in the Reynolds Building at RICHMOND, VIRGINIA.

Mr. Blackwelder, formerly chief engineer, will devote his time to planning for future expansion of production and fabricating facilities of the company.

DURWOOD J. HEDGECOCK has been promoted to chief engineer. He came to Reynolds in 1947 as a plant engineer. Since 1952 he has been a division staff engineer of sheet, plate, wire rod and bar division.

Southern Engineering Adds Parker O-Rings

Appointment of SOUTHERN ENGINEERING SERVICE, INC., International Airport, MIAMI 48, FLORIDA, as authorized distributor of Parker o-rings is announced by THE PARKER APPLIANCE COMPANY, Cleveland, Ohio.

HENRY WEAVER, vice-president of Southern Engineering Service, reports his firm will stock a range of sizes and kinds of o-rings for prompt servicing of needs in the Florida area. The new distributor, for technical assistance on sealing applications, will have call on the services of Lew C. ELY, Parker district manager in Atlanta.



WAREHOUSE DIVISION HAS

EXPANDED

To provide more room for additional steel products—particularly heavy structurals up to 65 feet long—our warehouse space has been increased by 50%. Now more than 100,000 square feet are used to stock warehouse items for immediate delivery to our customers.

In addition to more space, new equipment has been installed, including a new friction saw, a power hack saw, and an additional plate shear.

These new improvements make Atlantic Steel's Warehouse Division not only one of the largest, but also one of the most complete steel warehouses in the South.

For steel in a hurry—one piece or a carload—call, write or wire.





A firing system that's inadequate and expensive may be eating into your profits . . . unnecessarily! Convert to gas—and increase profits—by cutting labor costs, eliminating coal hauling, ash-removal, flue and tube cleaning. Gas requires less maintenance on equipment, increases efficiency, and effects greater savings! Present system can usually be retained as a stand-by.

Consult McBurney Stoker and Equipment Company, makers or suppliers of the best boiler room equipment available, on all problems. If your firing system requires wood, coal, gas, oil, or any combination thereof, McBurney Stoker and Equipment Company has designedunits to fit your particular needs. They have served industry since 1911, and can offer you the finest equipment, including: Copes-Vulcan Boiler Controls, Copes Feedwater Regulators, Vulcan Soot Blowers, McBurney Underfeed Coal Stokers, Aqua Electric Scale Control, Gas and Oil Burning Equipment.

MCBURNEY STOKER AND EQUIPMENT COMPANY

SINCE 1911

2110 Peachtree Road, N.E. Atlanta, Georgia

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News for the South and Southwest (continued)

Southern Appointment for Dupont of Diamond Alkali

DIAMOND ALKALI COMPANY has announced the promotion of GEORGE V. DUPONT, chief staff engineer of the Central Engineering Department since October, 1954, who becomes manager of manufacturing operations for Diamond Black Leaf Company, which was recently organized by Diamond and Virginia—Carolina Chemical Corporation to carry on the manufacture and marketing of Black Leaf pest-control products.

At his new post, Dupont will be reaponsible for manufacturing operations at Diamond Black Leaf plants in RICHMOND, VIBGINIA; LOUISVILLE, KENTUCKY; MONTGOMERY, ALABAMA; and WACO, TEXAS.

An Alabamian, born in Montgomery, Dupont was a resident of Louisville for a number of years prior to his graduation in 1934 from Purdue University with a B.S. degree in chemical engineering. He joined Diamond in 1940, and since then has served the company in various engineering capacities.

Avisco-Front Royal, Va.

THOMAS F. BRASTOW has been promoted to technical consultant to Plant Manager A. G. McVay at American Viscose Corporation's Front Royal, Va., rayon plant. Previously technical superintendent there, Mr. Brastow will be succeeded by James E. Corr, formerly staff assistant to Julian F. Murrin, manager of the Nitro, W. Va., plant.

A graduate of Carnegie Institute of Technology with a B.S. degree in chemical engineering, Mr. Brastow joined Avisco in 1927.

Florida Plant Reports Good Service From 1901 Reynolds-Corliss Engine

The Reynolds-Corliss improved steam engine, referred to by engineers in the last quarter of the 19th century as "the most remarkable steam power yet invented," continues to provide satisfactory service in various installations.

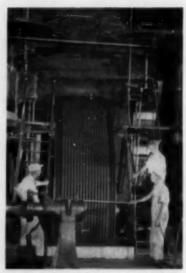
A specific instance is this 23 by 48 by 42-in. Allia-Chalmers vertical cross-compound Corliss engine built in 1901 and still being used as a main drive to saw cypress logs at the LEE TIDE-WATER CYPRESS Co., PERRY, FLA., where it was installed in 1913.

The 18-ft diameter flywhoel is fitted with a 20-groove endless Manila 1%-in. rope drive about 2000 ft long which powers the line shaft and, in turn, the saws_used to cut the logs.

Allis-Chalmers built its last steam engine in 1938. Long before that, however, the company started making steam turbines and it has been producing steam prime movers continuously for 85 years—a record no other major American manufacturer can match.

It is estimated that there are still some 500 Allis-Chalmers steam engines providing power for various mills, factories and breweries.

Installed at the same time as the steam engine when the mill was built by the Burton Swartz Cypress Co., predecessor to the Lee Tidewater



This vertical Corliss engine, built in 1901, is still used as the main drive in Lee Tidewater Cypress Company's Perry, Florida, plant.

Cypress Co., is a Bullock generator (left front) built in 1904 and rated 133 amperes, 440 volts, three phase, 277 rnm.

The Bullock Electric Manufacturing Co. started in 1884 as the George F. Card Electric Co., was purchased by Allis-Chalmers in 1904 and today is the company's Norwood Works.

ASME Chicago Exposition

Announcement has been made that the CHICAGO EXPOSITION OF POWER AND MECHANICAL ENGINEERING will be held in the Chicago Coliseum, November 14 to 18, under the auspices of the American Society of Mechanical Engineers and in conjunction with their 75th anniversary meeting. Space reservations are already being made for the display, which will be located only a short distance from the hotels where the A.S.M.E. meetings will be held.

The exposition will be under the management of the International Exposition Co., 480 Lexington Avenue, New York 17, N. Y., which also conducts the National Exposition of Power and Mechanical Engineering, which has been held in New York for many years. E. K. Stevens is the exposition manager.

Cooper Alloy-Southeast

COOPER ALLOY CORPORATION announces the appointment of THE CAMERON & BARKLEY CO., CHARLESTON, S. C., as authorized distributors for their stainless steel valves, fittings and accessories. The ninety year old mill supply firm, with branches in SAVANNAH, GEORGIA; JACKSONVILLE, MIAMI, TAMPA and ORLANDO, FLORIDA, will be working very closely with James W. Jones of Montezuma, Georgia, Cooper Alloy's representative in the territory.

Wray Joins Duke Power Co.

JAMES Q. WRAY, JR., has joined DUKE POWER COMPANY as assistant to the chief engineer, it was announced recently by DAVID NABOW, vice president and chief engineer.

A native of York, S. C., and a graduate of Clemson College in electrical engineering, Mr. Wray has already assumed his duties in the company's general offices at Charlotte, N. C.

Formerly assistant chief engineerdesign of the Pennsylvania Water and Power Company and Safe Harbor Water Power Corp., Mr. Wray was living in Towson, Md., before accepting the Duke post. He served in World War II from 1942 to 1945 as a navy officer. He administered an \$80 million ship building program at Maryland Drydock Co.

A member of the American Institute of Electrical Engineers, Mr. Wray has had broad experience in many phases of electric utility operation.



JUST DIAL HIS NUMBER

Your Bunting Distributor carries in stock for your money saving convenience completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes, meeting all your usual production and maintenance needs. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, Bronze or Bearings, Bronze. Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. He has been especially selected for his responsibility and his understanding of bearing requirements. Ask him for the Bunting Catalog or write.

... for this speedy cost-saving bearing service

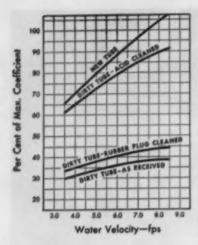
The local availability of Bunting completely machined and finished bronze bearings and bars is saving money, time and trouble in machinery maintenance everywhere in America. Stocks of Bunting Bronze Bearings and Bars constantly carried by Bunting Distributors are adequate to supply the needs of the whole nation for an indefinite time.





BRONZE BEARINGS . BUSHINGS . PRECISION BRONZE BARS

THE BUNTING BRASS AND BRONZE COMPANY, TOLEDO 1, OHIO BRANCHES IN PRINCIPAL CITIES



RESTORE condenser tube EFFICIENCY

90% of surface condensers do not perform as well as they should. One major cause is fouled tubes. And, only too often, when such tubes are rubber-plug cleaned, the results prove far from satisfactory.

In a recently reported test, it was shown that shooting rubber plugs through a fouled tube didn't fill the bill in successfully removing the type of scale encountered. See chart. But when the same tube was acid-cleaned, the heat transfer obtained approximated that of a new and clean tube.

Removing lime scale with that effective acid-descalant, Oakite Compound No. 32, more than repays for itself by the savings it makes in reduced turbine-steam consumption and lower fuel costs. It minimizes tube failure caused by partially obstructed tubes and eliminates the cost both of replacing tubes and of idle condenser capacity.

After you have removed lime scale with Oakite Compound No. 32, you can prevent further build-up by treating condenser circulating water with Oakite Airefiner No. 52. For further details, write for booklet. No obligation. Oakite Products, Inc., 23 Rector Street, New York 6, New York.



News for the South and Southwest (continued)

Graver Appoints Allen-Shuff

GRAVER WATER CONDITIONING CO., New York, has announced the appointment of the ALLEN-SHUFF CORPORATION of MEMPHIS and NASHVILLE as sales representatives. Their territory will include all of eastern Arkansas, northern Mississippi and western Tennessee from the Tennessee to Mississippi Rivers.

Allen-Shuff will handle Graver's complete line of industrial, municipal and industrial waste treatment equipment.

W. HARWELL ALLEN, vice president and general manager; CHARLES F. ALMAND, Memphis branch manager, and STEPHEN J. WILKIE, sales engineer, bring to Graver a background of experience in the power plant and water conditioning field that will be of value both to the organization and to its customers.

Allen-Shuff is located at 1121 Church Street, Nashville 3, Tennessee.

Texas Eastern Elects Jacobs Vice President

JOHN CLAYTON JACOBS, JR., WAS recently elected a vice president of TEXAS EASTERN TRANSMISSION CORPORATION. Jacobs, who has been executive vice president and a director of Wilcox Trend Gathering System, Inc., a subsidiary, will continue to operate in those capacities and in addition will assume executive duties with Texas Eastern. Although for the present continuing to maintain an office in Dallas, he is expected to move during the year to Shreveport, Louisiana, where the general offices of the parent company are located.

The Bulletin Board for Southern Industry

Southern & Southwestern manufacturers offer free literature on their latest developments in equipment and supplies.

See pages 92 & 93

OG&E Promotions

OKLAHOMA GAS AND ELECTRIC COM-PANY has announced a series of promotions and transfers in the operating and generation departments.

CLARENCE W. ANTHONY, formerly assistant superintendent of transmission and distribution, has become assistant to the vice president in charge of operations. Mr. Anthony, a graduate in electrical engineering from the University of Oklahoma, joined OG&E in 1935, after seven years' experience with other organizations in the electric industry.

LEO E. CAHILL, who has been chief engineer at the new Arbuckle Station for over two years, has returned to Muskogee where the company is constructing a 170,000 kw addition, and has been named chief of the Riverbank power plant.

Mr. Cahill is being replaced at Arbuckle station by FLOYD M. NEAL, formerly assistant chief engineer at Osage Station in Ponca City. Mr. Neal has been with OG&E since 1927.

B&W Atomic Energy Div. to Build New Lynchburg Plant

Plans for the construction of a major plant for the manufacture of fuel elements and other reactor core components for the nuclear power industry, were announced recently by the Atomic Energy Division of The Babcock & Wilcox Company. The plant, to be located about 5 miles east of Lynchburg, Virginia is expected to be completed by the end of the year.

Actual construction on the main building is expected to start immediately. It will be a one-story structure of approximately 100,000 sq ft, and will house various laboratories and offices as well as the complex manufacturing equipment.

B&W announced last year that it anticipates making complete nuclear steam generators for the production of electric power. The company has already developed and fabricated special equipment for many of the major atomic energy installations. The new plant will provide properly designed facilities for the manufacture of many types of special equipment for this rapidly growing industry.

Whipple to Manage New Rockwell Plant—Ky.

HARRY O. WHIPPLE, formerly factory manager of ROCKWELL MANU-FACTURING COMPANY'S Columbus, Ohio, plant, has been named general manager of a new Rockwell plant being built at RUSSELLVILLE, KENTUCKY.

Mr. Whipple joined the Pittsburgh-DuBois Company in 1936 before that company became a division of Rockwell. He later became superintendent of fabrication at the DuBois plant and, in 1952, was promoted to general superintendent of the Columbus plant, becoming factory manager there a year later.

Girdler Completes New Plant at Louisville, Ky.

A new \$1,000,000 plant, designed and constructed by THE GIRDLER COM-PANY, LOUISVILLE, KY., a division of the National Cylinder Gas Company, is nearing completion.

The plant is located on a nineteen acre tract, where all of Girdler's catalyst manufacturing operations are being consolidated. The site provides ample room for the company's continuing expansion program.

Work on the new structure began in May, 1954. Transfer of equipment and installation of new processing facilities are expected to be completed in April. As the result of ingenious scheduling, the company's output of catalysts has increased rather than declined during the change of manufacturing sites.

Girdler catalysts are used for hydrocarbon reforming, carbon monoxide conversion, hydrogenation, desulfurization and oxygen removal. In addition, catalysts are manufactured by procedures specified by customers to meet individual requirements.

Hobein Appointed Plant Mgr. Berea Rubber Co.—Kentucky

Appointment of EARL HOBEIN as plant manager of the Berea Rubber Company, Berea, Kentucky, was announced recently by The Parker Appliance Company, Cleveland, Ohio. The Berea plant manufactures O-rings for the Rubber Products Division of Parker.

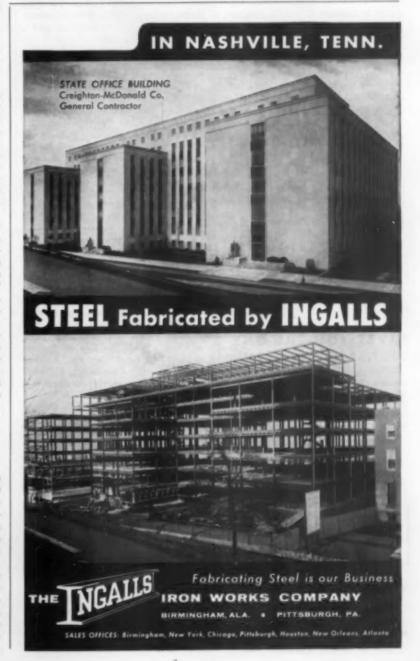
Hobein joined Parker five years ago as a process engineer. He was later made assistant to the director of research for Parker's rubber products and subsequently became assistant to the sales manager of the Rubber Products Division.

Lamberth to Manage La. Branch, Cooper-Bessemer

THE COOPER-BESSEMER CORPORATION, Mount Vernon, Ohio, recently announced the promotion of T. M. Lamberth, Jr., to manager of its branch office at 403 Lake St., Shreveport, Louisiana.

Mr. Lamberth fills the position formerly held by A. K. De France, who died a short while ago. As branch manager, Mr. Lamberth will direct both sales and application engineering of engine-driven and motor-driven compressors, as well as diesel, gasdiesel and spark-ignited gas engines.

A Mechanical Engineering graduate from Texas A & M, Mr. Lamberth was formerly Sales Engineer with Joseph A. Coy Company and Arrow Industrial Manufacturing Company, both manufacturers of heat transfer equipment. His assignment to the Shreveport office follows extensive service with Cooper-Bessemer's engineering and manufacturing facilities in Mount Vernon, Ohio.



Slo-Speeds Improve Paint Quality

Vertical, face mounted Slo-Speeds on our 300-gallon paint mixing vats have improved product quality, reduced production costs and decreased maintenance. Slo-Speeds require less space, provide greater safety, permit lower cost installation, and give us the exact low speed for our requirements in a single, compact, quiet, rugged unit, reports J. E. Gauntt, of Stebbins & Roberts, Inc., Little Rock, Ark.

STERLING SLO-SPEED



GIVES YOU THE ONE BEST LOW SPEED AND

gives uninterrupted service — carries heavy overhung loads — provides versatile mounting and flexibility in arrangement of machinery — saves valuable space — provides greater safety — costs less to install and use. An indispensable source of low speed power for:

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20-page illustrated catalog... Sterling Speed-Trol, Slo-Speed, Klosd and Klosd-Tite Electric Power Drives. Write for catalog No. 200

STERLING ELECTRIC MOTORS

Plants: New York City 51; Chicage 35; Les Angeles 29; Hamilton, Canada; Sentiage, Chile Offices and distributors in all principal cities

News for the South and Southwest (continued)

J&L Producing Steel Pails in Expanded Atlanta Plant

Production of steel shipping pails for southern manufacturers began recently on new facilities of Jones & LAUGHLIN STEEL CORPORATION in AT-LANTA, GEORGIA.

The new pail line has been installed in J&L's Container Division Plant at 1280 Chattahoochee Avenue NW. This plant replaced J&L's former galvanized ware production facilities here a little over a year ago.

Lacquer-lined and decorated steel shipping pails will be produced on the new line in 3½-gallon or 5-gallon capacity. Users of the pails will be companies which ship paint and varnish foods, oil and chemicals, soaps, shortenings, and many other products.

Growth of the paint industry in southern states was a major influence in J&L's decision to locate its new pail line in Atlanta, according to F. T. Barton, J&L's Vice President—Special Products & Services.

"Our galvanized ware plant here is the largest of its kind in the South," says Mr. Barton. "The new pail line adds still another service to an area where shipments of finished and semi-finished goods are rising fast year by year."

EUGENE L. BRINTLEY, is Plant Manager. The Atlanta Container Division Plant is one of nine operated by J&L. The others, which produce galvanized ware, steel shipping pails, and steel drums, are located in Bayonne, N. J.; Lancaster, Pa.; KANSAS CITY, KANSA; Cleveland; Philadelphia; NEW ORLEANS; Toledo, Ohio, and PORT ARTHUR, TEX.

J. F. Pritchard Promotions

J. F. PRITCHARD AND COMPANY, KANSAS CITY, MISSOURI, engineers and constructors for the power, petroleum, gas and chemical industries, recently announced two promotions in the organization.

W. W. Bodle, manager Process and Research Department has been named manager of Pritchard's Chicago District office.

PAUL W. LAUGHREY was named manager of the Process and Research Department. Prior to joining the Pritchard organization, he was chief of the Process Design Section, for five years, at the United States Bureau of Mines fuels demonstration plant at

Louisiana, Missouri, where he worked closely with the representatives of the National Petroleum Council in the design of commercial-sized Fischer-Tropsch and coal hydrogenation synthetic fuel plants.

Elliott Heads J&L Supply

RAINEY ELLIOTT has been named president of the Supply Division of JONES & LAUGHLIN STEEL CORPORA-TION, with headquarters at 108 N. Trenton St., Tulsa, Okla.

Mr. Elliott has served as general manager of the Supply Division since 1952. He was vice president and director of the J&L Supply Company prior to its incorporation as a division. He is a native of Memphis, Tenn., and a graduate of Texas Christian University.

Westinghouse—Kansas City

E. C. SEDLACK has been appointed Works Manager of the Westing-HOUSE AVIATION GAS TURBINE DI-VISION, KANSAS CITY, Mo.

Since coming to Westinghouse in April, 1954, Mr. Sedlack has been administrative assistant to W. W. SMITH, division manager. In his new post, he will be responsible for the plant operation of the division's Kansas City Works.

S. S. STINE has been appointed executive assistant to the division manager. Mr. Stine will be responsible for long range manufacturing planning and planning for work on a subcontract basis.

Hein Co., Baltimore, Appointed by Parker

LOUIS H. HEIN Co., 703 Light St., Baltimore 30, MD., is announced as authorized distributor of tube and hose fittings of the PARKER APPLI-ANCE COMPANY, Cleveland, Ohio.

The Baltimore plant, established only recently, will carry a wide range of Parker fittings in addition to their other items for prompt servicing of needs in the area. RICHARD L. MOHLHENRICH is in charge of sales and engineering.

Fleming & Sons Announce Promotions-Dallas, Tex.

A series of managerial promotions and changes has been announced by FLEMING & SONS, INC., DALLAS, TEXAS. JOE B. FLEMING has been named president and treasurer of the company. JOHN G. FLEMING is chairman of the board and executive vice

Other officials and plant supervisors are E. T. Fleming, Jr., vice president; Walter L. Fleming, vice president and plant manager; C. H. Johnson, secretary; Robert Fleming, assistant plant manager; Robert Miller, acting superintendent of plant, and E. T. Fleming, III, purchasing agent.

The Fleming paper mill occupies 44 acres and employs about 425 persons. Products of the company are mainly for the folding box board industry, container board industry and the gypsum board industry. They are generally for Southern and Southwestern states, but specialty items go beyond this area.

Micro Switch Opens Phoenix and Charlotte Offices

Establishment of new sales and engineering offices in Phoenix and Charlotte is announced by Micro SWITCH, a division of MINNEAPOLIS-HONEYWELL REGULATOR COMPANY.

The new facilities will be located in Honeywell sales and service offices in each of the two cities and will be managed by former Micho Switch division field engineers.

Ralph C. Froehlich, formerly of Los Angeles, heads the new Phoenix office; and Donald S. Schultz is being transferred from Philadelphia to take charge of the Charlotte office.

MICRO SWITCH, with headquarters in Freeport, Ill., is a leading manufacturer of precision snap-action switches for industrial and aircraft

D. J. Murray-Ala., Fla.

BROWNLEE - MORROW ENGINEERING Co., 745 North 44th St., BIRMINGHAM, ALABAMA, has been appointed distributor of "GRID" Unit Heaters, according to an announcement from D. J. MURRAY MANUFACTURING COM-PANY, Wausau, Wisconsin. The Brownlee-Morrow Engineering Co. will cover the entire state of Alabama, and several counties in Florida.

DURAMETALLIC Packings



Product of

Durametallic wear-free packings. DURAMETALLIC CORP., KALAMAZOO, MICH.

Also manufacturers of rotary mechanical seals, oil pressure systems and packing tools.

install peak performance into your COMPRESSORS (AIR · GAS · AMMONIA)







Peak performance, maximum efficiency, greater output, and lower power costs can be built into your oldest, and of course your newest, compressors by the installation of VOSS VALVES.

THESE VOSS VALVE ADVANTAGES:

₩ Quiet, vibration-free operation ₩ 20 to 60% more valve area 🛩 less power consumption 🛩 minimum pressure loss normal discharge temperature 🛩 lower operating costs utmost safety

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News for the South and Southwest (continued)

Republic Flow Meters Promotes Dist. Mgrs.

REPUBLIC FLOW METERS Co., Chicago manufacturer of combustion controls and industrial instruments has announced the appointment of RALPH E. Holmes as manager of its Philadelphia District. Mr. Holmes was formerly manager of the Cincinnati District.

STAN HAMMARSTROM who succeeds Mr. Holmes as manager of Republic's Cincinnati District has been in Republic's project engineering department for several years.

Alabama Bearings Named Clark Distributor

ALABAMA BEARINGS COMPANY, INC., 25 E. Railroad Street, MONTGOMERY, ALABAMA, has been appointed a distributor for Clark Controller Company, Cleveland. The company will distribute Clark's full line of push buttons, relays, contactors, starters, and related control equipment.

Rockwell Promotes Davenport of Atlanta

NELSON E. DAVENPORT, sales engineer in ROCKWELL MANUFACTURING COMPANY'S Meter and Valve Division district office at ATLANTA, GA., for the past five years, has been named assistant gas products manager with headquarters in Pittsburgh.

A 1947 chemical engineering graduate of the University of Texas, Mr. Davenport worked for Taylor Refining Company of that state for three years before joining Rockwell.

The Bulletin Board for Southern Industry

Southern & Southwestern manufacturers offer free literature on their latest developments in equipment and supplies.

See pages 92 & 93

Three Miles of Conveyor Belts Serve TVA Plant

(Starts on page 57)

grounds. On this leg of its journey, the conveyor system is supported by towers 50 feet above ground and well above flood level. Metal housings totally enclose all the conveyor belts to protect them and other conveyor equipment from the elements. The stream of coal spans a 100-ft wide channel and bridges a road as it speeds toward the crusher into which it unloads.

The crusher building is a steel structure rising to the height of a four-story building. Here the coal is crushed to small pieces not larger than one and one-quarter inches. The crusher tower also houses an electronic control of the entire belt system.

To Bunkers or Storage

Coal destined for immediate plant use is carried by twin conveyor belts from the crusher up a 16-degree incline to the level of storage bunkers at the top of the steam plant. The twin belts, loaded

underground beneath the crusher, lift the coal 115 feet high in a distance of 425 feet. These belts are 42 inches wide and each handles 700 tons of coal an hour.

The twin elevating belts unload onto twin horizontal belts which run 855 feet across the full length of the building and above the storage bunkers. Use of a movable "tripper" device enables the belts to unload their cargo into any one of the 10 bunkers which feed fuel into the boilers. Once in the storage bunkers, the coal flows by gravity into a pulverizer which powders it. The powdered coal is then mixed with air and blown into the boilers as fuel.

Coal destined for storage leaves the crusher in a direction opposite to plant-bound coal. A 336-foot belt, measuring 42 inches wide picks up the coal underground, beneath the crusher, and conveys it to a stockpiling area. To reclaim coal from stockpile for plant use, two other conveyor belts

operating in tunnels are loaded from hoppers near the toe of the stockpile and return the coal to the loading point beneath the crusher. These belts are 200 feet long, 42 inches wide and handle 700 tons an hour.

Coal shipped by railroad is picked up by a southern leg of the belt system at the rotary car dumper. Coal cars are unloaded onto a 712-foot belt which carries the coal to the crusher. The 54-inch belt handles 900 tons an hour.

To install the 14,746 feet of rubber conveyor belt used on the belt-road, rolls of belting weighing up to 20,000 pounds and as long as 1,765 feet were shipped to the plant site by rail. A portable electric vulcanizer was used by B. F. Goodrich technicians to make the belts endless. A total of 15 splices were required.

Fuel Bill Cut

(Starts on page 50

simple in accomplishment. Referring to Figure 1, the so-called bypass damper was noted with interest. It was found that the boilers were being operated with these dampers in half-open position.

No one at the plant appeared to know just why, or what purpose was served by the dampers except possibly for control of superheat temperature.

With this rather vague information a series of tests were conducted with the damper in all possible positions.

It may be seen readily that with the damper wide open, combustion gases would almost entirely bypass the rear bank of boiler tubes and escape up the stack.

Study of data obtained from the tests Figure 3, showed that operation with the damper closed would reduce the flue gas temperature by 80 degrees at an expense of less than 20 degrees of superheat temperature. The loss in turbine efficiency was negligible when compared with the savings from a further increase of about 1.0% in boiler efficiency.

With a fuel consumption of about 70,000 tons per year even a small percentage in reduction represents many thousand dollars.



EXTRA YEARS OF MORE DEPENDABLE POWER

and at less cost per pound of steam

TODD BURNERS

GAS OR OIL

TODD SHIPYARDS CORPORATION

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High Pressure Composition ERNST RUBBER GASKETS

All sizes to fit your gages and valves





FIG. 21-Lip Mold

FIG. 22-Standard

ERNST WATER COLUMN & GAGE CO.

Free Reader Service

Free literature on the latest developments in equipment and supplies is offered by leading Southern and Southwestern manufacturers.

For your copy, circle the item number an one of the reader service post cards provided on pages 17 and 18.

Bulletin Board for Southern Industry WHAT'S NEW and Where to Get It

S-1 TRANSFORMERS — Brochure, a pages—Describes complete line of distribution and power transformers in sizes from 3 kva to 15,000 kva, and up to 115 kv primary class. Eighteen features of distribution transformer design are outlined and data on coll and core assembly is presented. —CENTRAL TRANSFORMER CORPORATION, P. O. Box 637, Pine Bluff, Arkansas.

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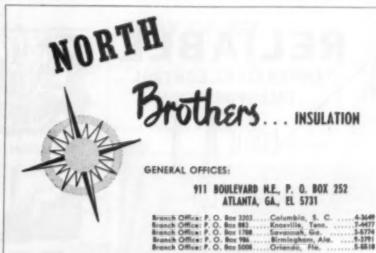
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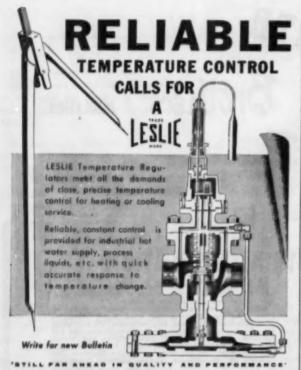
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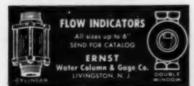
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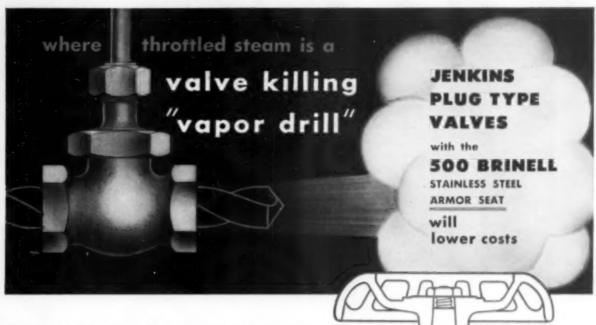
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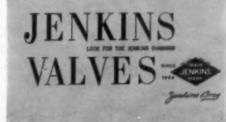
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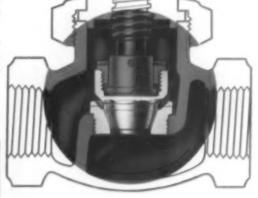
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